

IX.—*On some South African Arachnida belonging to the Orders Scorpiones, Pedipalpi, and Solifugæ.*—By W. F. PURCELL, Ph.D.
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THE present paper comprises a revision of the South African Scorpions of the genus *Parabuthus*, descriptions of 7 new species and 3 new varieties of Scorpions, 1 new Pedipalp, 9 new species and 1 new genus of *Solifugæ*, and a list of new localities for species of *Uroplectes*, *Opisthophthalmus*, *Solpuga*, and *Hexisopus*, together with notices of the local variations in structure or colouration so frequently met with in many cases.

ORDER SCORPIONES.

GEN. BUTHUS Leach.

BUTHUS ARENACEUS, n. sp.

♀. *Colour.*—Cephalothorax with its anterior margin, its crests and the ridges above the lateral eyes black; the ocular tubercle also black, except along the mesial groove, which is yellow; tergites of abdomen each greenish-ochraceous anteriorly but pale yellow posteriorly, the crests, especially the lateral ones, blackened; superior crests of pedipalps and the 4 inferior crests of tail finely blackened.

Cephalothorax wider than long; the upper surface hairless densely and finely granular throughout; the crests, including the superciliary ones, granular; the middle and posterior medial crests united on each side, forming a sharp angle at the junction which is

situated just midway between the median eyes and the hind margin, the area enclosed between these medial crests, therefore, suddenly constricted in its middle and attenuated in its anterior half; middle lateral crests weak, especially posteriorly, not reaching the medial crests. Ocular tubercle finely granular between the crests.

Tergites of abdomen all very densely and finely granular throughout, with 3 finely granular crests which are not recurved in the anterior segments.

Sternites of abdomen all, including the first, densely and finely granular over the whole surface, the last with 4 very distinct, finely granular keels; segment 4 with 2 distinct lateral and 2 very weak and short, medial, finely granular keels, segments 2-3 with finely granular lateral keels, but no medial keels, segment 1 without keels.

Tail moderate, with very few hairs; segments 2-6 of equal width, decidedly narrower than segment 1; segments 1-4 with 10 finely granular, well-developed crests; segment 5 with very finely granular superior and finely granular infero-median crests, the infero-lateral crests finely granular anteriorly but composed of coarser lobe-like teeth posteriorly, the accessory crests of the under surface distinguishable in the anterior half of the segment, the lateral surfaces with rudiments of an accessory crest along the middle and lobate at hind margin. All the caudal surfaces densely and finely granular throughout in segments 1-5; the vesicle weakly granular, only the upper surface, a lateral and 2 inferior longitudinal bands smooth. Upper surface grooved along the median line in all the segments, and provided in segments 1-4 with a median area which is more minutely and densely granular than the lateral portion of the upper surface; this median area bordered on either side by a row of larger granules; upper surface in segment 5 strongly convex on each side of the median groove throughout the whole length, the convex portions densely granular and much more elevated than the superior crests. Vesicle very stout, at least as wide as and very much higher than segment 5; the aculeus weak, very short, much shorter than the vesicle.

Pedipalps.—Femur finely and densely granular on all sides. Tibia finely and densely granular, the granulation on the almost smooth posterior surface very weak and minute, the anterior and posterior sides almost parallel in the middle third. Hand slenderer than the tibia, very minutely granular, the posterior surface almost smooth; hand with 2 anterior and 2 posterior weakly crenular or almost smooth crests, and with rudiments of other crests on the upper

surface; fingers with 11 main rows of teeth, the movable finger with 12 anterior flanking teeth, its length $2\frac{1}{6}$ times that of hand-back.

Legs.—Femora and tibiae finely granular, with granular keels.

Pectines with 18 teeth, the posterior basal lamella of the scape sharply angular at the posterior inner corner, bearing 2 teeth on its hind margin, the scape itself not reaching apex of trochanter.

Locality.—1 ♀ (Reg. No. 2206) found by Mr. M. Schlechter between Henkries and Wolftoon in Little Bushmanland, Namaq. Div., Cape Colony, in February. As no genital stylets could be found I conclude the specimen must be a ♀.

Measurements.—Total length 35 mm.; length of cephalothorax $4\frac{1}{3}$, of tail 21, of fourth caudal segment $3\frac{1}{2}$, of tibia of pedipalp $4\frac{1}{2}$, of movable finger 5; width of fourth caudal segment 2, of tibia of pedipalp 1.6.

This is, I believe, the second specimen of the genus recorded from South Africa, the only other example being the type of *B. conspersus* Thor. from "Caffraria." The latter, besides being greenish-red, with 5 rows of black spots above, the vesicle banded with infusate stripes and the legs and pedipalps spotted with black, has almost smooth abdominal sternites but appears to agree in almost every other respect very closely with *arenaceus*. C. L. Koch (Arach. v. 6, p. 77) has also recorded a specimen of *B. thessandrus* (Koch) from the Cape, but this locality seems doubtful.

GEN. PARABUTHUS Poc.

(A revision of the South African species.)

A revision based on an examination of a large series of specimens from different localities is still needed for a clear conception of the South African species of this genus, and although several of the described species are still unrepresented in the Collection the latter is nevertheless sufficiently large for this purpose, as the list of specimens given below will show.

Specific Characters.—Excellent specific characters showing little or no variation are afforded by (1) the form and size of the shagreened area on the upper surface of the first caudal segment, (2) the degree in which the middle lateral keel is developed in the fourth segment, (3) the granulation of the lower surface and of the

upper edges of the fifth segment, (4) the relative width of the tibia and hand of the pedipalp in the adults of both sexes, (5) the shape of the tibia of the pedipalp, (6) the form of the posterior upper edge and of the infero-lateral keels of the second and third segments, (7) the size of the vesicle, &c. Slightly more variable but not unimportant characters are the relative width of the caudal segments, the duplication of the superior crests in segment 4, the form of the basal lamella of the scape of the pectines in the ♀, &c. The form of the shagreened area on the second caudal segment, the number of the flanking teeth on the fingers of the pedipalps, the colouration, and a few other characters, may vary considerably in the same species according to the locality of the specimens.

Sexual Differences.—The ♂, even while young, is easily distinguishable from the ♀ owing to the presence of a pair of little chitinous stylets, which are situated in the posterior region of the genital orifice and become visible on lifting the halves of the operculum. In the ♀ the operculum is also divided into two halves, but there are no stylets. Besides this there are other sexual differences, notably in the structure of the pectines. In the ♀ the basal lamella of the scape bears one or no teeth on its posterior side, which is nearly always produced into a large, broad, obtuse lobe. In the ♂ the scape is generally angular and only slightly, if at all, produced at the base behind and toothed almost throughout its length, the basal lamella mostly bearing 2 or 3, rarely only 1 tooth on its hind margin. The basal lamella is, however, produced in the ♂ of *calvus* and not produced in the ♀ of *granulatus*. Sometimes also the proximal tooth of the pectines is reduced in size in the ♀. The number of the teeth generally runs higher in the males than in the females. In the adult ♂ also the hand and to a lesser degree the tibia of the pedipalp is generally stouter, the fingers are relatively shorter, and the granulation of the tergites and cephalothorax is sometimes more pronounced than in the ♀. In all stages preceding the adult form the hand and fingers of the ♂ nearly resemble those of the ♀ in their proportions. I have been unable to detect any differences in the tail between the ♂ and ♀ which may with certainty be regarded as sexual characters.

Distribution.—The narrow strip of rainy country along the south coast is inhabited by a single species, *capensis*, which is, however, very abundant and extends from the Divs. of Tulbagh, Worcester, and Caledon in the west, eastwards at least as far as the Divs. of Port Elizabeth and Albany. Northwards the species extends for a short distance into the lower parts of the Karroo, where it mingles

with *neglectus* and *granulatus*, e.g., in the Divs. of Worcester, Robertson, and Uitenhage. To the north-east of this coast strip is an area of unknown extent but comprising the Divs. of Graaff Reinet and Albert, which is inhabited by a variety of *capensis* which I have called *frenchi*.

To the north of the rainy coast strip is a vast dry and elevated area of karroo-like country with very little rain, inhabited principally by the two species *neglectus* and *granulatus*, which are found right up to Bushmanland and German South-West Africa, while to the east *granulatus* has been found to occur as far as the Divs. of Victoria West and Uitenhage. The actual northern and eastern limits of these species are, however, not yet known.

P. calvus has been found in only two localities in the Divs. of Calvinia and Clanwilliam, i.e., within the distribution area of *neglectus* and *granulatus*. It is, however, exceedingly rare.

In the north-western part of Cape Colony is an extremely arid tract of country known as Great and Little Bushmanland (forming part of the Divs. of Kenhart and Namaqualand), the fauna of which appears to resemble that of German South-West Africa rather than that of the rest of Cape Colony. In this region no fewer than six species, viz., *brevimanus*, *lavifrons*, *villosus*, *schlechteri*, *neglectus*, and *granulatus*, have recently been collected by Mr. Max Schlechter, who found them living side by side. Of these the first four are not known to occur in other parts of the Colony to the south of the Orange River, while at least four, but probably all of them, are found in German South-West Africa. From the latter region another form, *P. raudus* (Sim.), has been recorded by Simon.

The only other species which have been described from Cape Colony are *P. flavidus* Poc., *P. obscurus* and *pachysoba* Penth., all from Bechuanaland, but unfortunately the Museum possesses no material from this part of the country.

Only one species, *P. transvaalicus* Purc., has been recorded from the Transvaal, and one, *P. mosambicensis* (Pet.), from Rhodesia.

The South African species known to me may be determined from the following table :—

- a. Posterior upper edge of 2nd caudal segment strongly elevated and curved forwards in the middle. Legs yellow. Western Divs. of Cape Colony (from Tulbagh and Worcester Divs. northwards), German South - West Africa 5. *P. neglectus* Purc.
- b. Posterior upper edge of 2nd caudal segment perfectly straight.
 - a¹. Sides and under surface of 4th caudal segment densely and finely

granular throughout, but without crests. Bushmanland (Cape Colony), German South-West Africa 3. *P. brevimanus* (Thor.).

*b*¹. Sides and under surface of 4th caudal segment either with crests or not densely granular throughout.

*a*². Middle lateral crest on 4th caudal segment strong and well developed, coarsely granular throughout.

*a*³. Superior crest in segment 5 more or less obliterated in the middle of the segment by the dense granulation of the sides, which extends here over the superior edges right up to the indistinct row of 4-6 low rounded (rarely conical) granules representing the accessory crests. Cephalothorax finely granular. (Upper surface of 1st caudal segment very flat, as wide as long, with parallel sides, the shagreened area occupying more than half the width of this surface. Hand never thicker than the tibia of pedipalp.)

*a*⁴. Upper surface of 2nd caudal segment with large shagreened area extending continuously from anterior to posterior margin. South-coast Divs. of Cape Colony . . 1*a*. *P. capensis* (H. & E.).

*b*⁴. Upper surface of 2nd caudal segment with an oval shagreened area on its anterior half. North-east Divs. of Cape Colony.

1*β*. *P. capensis* var. *frenchi*, nov.

*b*³. Superior crest in segment 5 always distinct throughout the whole length and very strong, sometimes slightly weaker in the middle of the segment, flanked here on the inner side by a short accessory crest of very coarse, generally sharply pointed or subspini-form, sometimes blunt, tubercles. Cephalothorax rather coarsely granular.

*a*⁵. Segment 4 of tail always decidedly narrower than segment 1, the tail more or less densely hairy. Congo, Benguela, German South-West Africa, Bushmanland (Cape Colony.)

6. *P. villosus* (Pet.).

*b*⁵. Segment 4 of tail wider or at least not narrower than segment 1, tail sparsely hairy.

*a*⁶. Caudal segments thickly granular at the sides and below, especially in the posterior segments. Legs and pedipalps dark brown to black. Transvaal.

7. *P. transvaalicus* Purc.

*b*⁶. Caudal segments sparsely granular, the posterior segments below more thickly granular. Legs and pedipalps yellow. Bushmanland 8. *P. schlechteri* Purc.

*b*². Middle lateral crest on 4th caudal segment rudimentary, except perhaps quite posteriorly.

*a*⁷. Tibia of pedipalps strongly prominent on anterior side, its length along the upper side only about twice its width at base of large anterior tooth. Cephalothorax about as long as wide. Bushmanland (Cape Colony), German South-West Africa.

4. *P. levifrons* (Sim.).

*b*⁷. Tibia of pedipalps slender, its length $2\frac{1}{2}$ -3 times its width. Cephalothorax much wider than long.

*a*⁸. Upper surface of 1st caudal segment flattened, projecting step-like and then suddenly descending perpendicularly at the anterior margin of the very broad shagreened area; 4th and 5th segments almost smooth or with a few granules below. Calvinia and Clanwilliam Divs. 2. *P. calvus* Purc.

- b⁸. Upper surface of 1st caudal segment not flattened but hollowed out from side to side, the narrow shagreened area not projecting step-like anteriorly but descending gradually in a median groove; 4th and 5th segments very densely granular below. Western half of Cape Colony (except along south coast), German South-West Africa . . . 9. *P. granulatus* (H. & E.).

§ A.—Species in which the hand of the pedipalp is equally slender in the adults of both sexes, and never exceeds the tibia in width.

1a. *PARABUTHUS CAPENSIS* (TYPICUS) (H. & E.).

1828. *Androctonus c.*, Hemprich and Ehrenberg, Symb. phys., Scorp. No. 10.

1839. *A. Iros*, C. L. Koch, Arach., v. 5, p. 93, fig. 101.

1844. *A. Kochii*, Gervais in: Walckenaer, Ins. Apt., v. 3, p. 45 (Koch's species renamed).

1889. *Buthus planicauda*, Pocock, Ann. Mag. N. H. (6), v. 3, p. 344, pl. 15, fig. 5. (The specimens described by Pocock as the ♂ of this form belong to a different species, as they have incrassated hands.)

1899. *Parabuthus capensis*, Kraepelin, Das Tierreich, Scorp. and Pedip., p. 31. (Here also the ♂, described as having incrassated hands, belongs to a different species.)

1900. *P. c.*, Penther, Ann. Naturh. Hofmus. Wien, v. 15, p. 154.

♂ ♀. *Colour*.—Trunk (cephalothorax and abdomen) varying from ochre-yellow to dark olive-green; tail mostly ochraceous, sometimes pale yellow or brownish to greenish-yellow, posterior segments not blackened; legs and pedipalps pale yellow (sulphur-yellow in fresh specimens, becoming more ochraceous under the action of spirits).

Cephalothorax broader than long, its upper surface densely and rather finely granular throughout and almost devoid of hairs; eye-tubercle granular except on the smooth superciliary ridge, moderate in size, the eyes medium-sized, the distance between them twice, rarely as much as $2\frac{1}{2}$ times their diameter.

Tergites of abdomen densely and finely granular throughout, the granules in the anterior half of each of the first 6 segments very fine; segment 7 with large, finely shagreened, mesial area, thickly granular over the rest of the surface, and provided with 4 strong lateral keels.

Sternites smooth and polished, segments 1-4 granular only at the extreme lateral borders, and, in the ♂, in front of the spiracles; seg-

ment 5 granular laterally in the ♂, less granular or almost smooth in the ♀, its 4 keels smooth or subcrenular.

Tail stout, sparsely hairy; segments 1-4 of equal width, or segments 2-3 slightly wider than segments 1 and 4; segment 4 slightly narrower than, as wide as, or even slightly wider than segment 1; segment 5 high, segment 1 intermediate between segments 4 and 5 in height; vesicle large, its width $\frac{3}{4}-\frac{5}{7}$ that of the fifth segment in its widest part.

Segments 1-4 with 10 well-developed, granular, sub-moniliform keels; the inferior keels of segment 1 smooth anteriorly; infero-median keels of segment 4 abbreviated or indistinct posteriorly; middle lateral keel of segment 4 well developed throughout its whole length, not at all or scarcely weaker than the adjacent lateral keels of the same segment; superior keels of segments 2-4 often with a posterior granule enlarged and tooth-like, but not spiniform; superior crests in segment 5 distinct and well developed in the anterior third of the segment, and often again quite posteriorly, but more or less obliterated in the middle, where the dense granulation of the sides of the segment spreads over the upper edges right up to the indistinct row of 4-6 low rounded granules which represent the superior accessory crest on either side. Teeth of the inferior lateral keels in segment 5 often only slightly larger and broader posteriorly.

Upper surface in anterior segments reticularly granular laterally, but very finely and densely granular (shagreened) mesially, the upper surface in the posterior segments smooth or nearly so. Segment 1 very flat above, not grooved mesially, its upper surface* as wide as long, with parallel crests; the shagreened area very large, flat or only very slightly depressed, occupying in its widest part a little more than half the width of the upper surface, constricted posteriorly and then widened again at the hind margin, its anterior edge slightly projecting forwards in the middle, very broad, equalling half the width of the upper surface, which descends very suddenly and quite perpendicularly along this edge. Segment 2 also flattened above, its upper surface longer than wide, with parallel crests; the shagreened area generally lightly concave anteriorly, shaped as in segment 1, but longer and narrower, about $2-2\frac{1}{3}$ times as long as wide, occupying in its widest part half or almost half the width of the upper surface, the anterior edge descending nearly or quite as sharply perpendicularly as in segment 1, and almost straight or curving forwards only slightly in the middle. Segments 3-5 deeply

* By upper surface is meant the highest portion of the segment, which is bordered by the superior crests.

grooved above along the middle, the groove minutely granular in segment 3, but smooth in segment 5.

Lateral and under surfaces thickly and, for the most part, finely granular between the keels, except in segment 1, which is generally more or less smooth below; segment 5 very thickly granular throughout on the sides and below, the under surface with larger blunt granules scattered about between the median and lateral crests, without, however, forming accessory crests, the median crest formed of a raised ridge along which coarse granules are irregularly arranged, often almost biseriately, the anterior part, however, often (more rarely the whole), forming a regular single series.

Pedipalps.—Femur finely granular above. Upper surface of tibia finely but often very weakly granular, without distinct anterior crest; anterior and posterior sides of tibia nearly parallel in the middle, the length along the upper side in the ♀ $2\frac{2}{5}$ – $2\frac{1}{2}$ times, in the ♂ $2\frac{1}{2}$ – $2\frac{2}{3}$ times its width at the base of large anterior tooth. Hand smooth, slender, its width equalling or even slightly less than that of the tibia in both sexes; length of movable finger in the ♀ about $2\frac{1}{5}$ – $2\frac{1}{3}$ times, in the adult ♂ slightly less, about 2 – $2\frac{1}{5}$ times the length of hand-back, this finger normally with 13, more rarely 12, anterior (inner) flanking teeth (counting in the inner distal pair at the apex of the most distal of the main rows), the main rows composed of 6–9 teeth (including the enlarged tooth) in the middle third of the finger.

Pectines with 28–35 teeth in the ♀, and 32–36 teeth in the ♂, the posterior basal lamella of scape produced into a broad lobe behind in the ♀, normal in the ♂.

Measurements * of a ♀.—Total length 83; length of cephalothorax $8\frac{1}{3}$, width $9\frac{2}{3}$; distance of eyes from anterior margin $3\frac{1}{2}$, from posterior margin $4\frac{1}{5}$; length of femur of pedipalp $6\frac{2}{3}$, of tibia $6\frac{3}{4}$, of hand-back 3, of movable finger 8; width of femur $2\frac{1}{5}$, of tibia $2\frac{3}{4}$, of hand $2\frac{1}{2}$; length of tail 45; length and width of first caudal segment 6, $6\frac{1}{3}$, of second $6\frac{1}{3}$, $6\frac{1}{3}$, of third $6\frac{2}{3}$, $6\frac{1}{3}$, of fourth $7\frac{1}{5}$, 6, of fifth 9, $5\frac{2}{3}$, of sixth $8\frac{3}{4}$, 5; height of fourth segment $5\frac{1}{4}$, of fifth 5; length and width of upper surface of first segment $3\frac{3}{4}$.

* Total length is measured from anterior edge of cephalothorax to tip of sting; length of femur and tibia of pedipalps is taken along the upper side, that of the caudal segments laterally from the hind margin of the segment to the anterior edge of the large angular prominence which terminates the superior crests in front; width of tibia of pedipalps is taken just distal to the large anterior tooth or spike. In measuring the width of the hand, the latter is pressed against the tibia at right angles to it, so that the anterior finger is only a little higher than the movable finger, the width in this position being also equivalent to the greatest transverse diameter of the hand. In the width of the upper surface of a caudal segment the superior crests are included.

Of a ♂.—Total length 65; length of cephalothorax $6\frac{3}{4}$, width $7\frac{1}{8}$; distance of eyes from anterior margin $2\frac{1}{5}$, from posterior margin $3\frac{1}{8}$; length of femur of pedipalp 6, of tibia 6, of hand-back 3, of movable finger $6\frac{1}{8}$; width of femur $1\frac{3}{4}$, of tibia 2, of hand $1\frac{1}{5}$; length of tail $39\frac{1}{2}$; length and width of first caudal segment $4\frac{3}{4}$, 5, of second $5\frac{1}{4}$, $5\frac{1}{6}$, of third $5\frac{1}{2}$, $5\frac{1}{5}$, of fourth $6\frac{3}{8}$, 5, of fifth $7\frac{1}{4}$, $4\frac{3}{4}$, of sixth $7\frac{1}{3}$, $3\frac{5}{6}$; height of fourth segment $4\frac{1}{4}$, of fifth 4; length and width of upper surface of first segment $3\frac{1}{2}$.

Locality.—This description has been taken from 13 ad. ♂, 12 ad. ♀, and a large number of young of various sizes from Slanghoek, Worcester Div.

Besides these, however, there are a number of specimens of all sizes from many different localities, making a total of nearly 300 in the Collection. These have been compared with the above description and found to agree with it so closely that I have been able to detect scarcely any differences worth mentioning. In some males the number of the pectinal teeth runs up to 38. The largest ♀ (from Worcester) measured 97 mm., and the largest ♂ (from Brakkloof) 66 mm.

The species in its typical form appears to be confined to the southern districts of Cape Colony.* It is generally very plentiful, and occurs nearly everywhere within its area of distribution, which, so far as known, extends along the south coast from the Divisions of Tulbagh, Worcester, and Caledon in the west, as far as Port Elizabeth and Albany in the east. This area includes the moister coast-strip as well as the southernmost parts of the more arid karroo.

The following is a list of localities from which specimens of the typical form have been obtained:—

A. *With the movable finger normally with 12–13, or with 13 anterior flanking teeth, in the latter case varying in some specimens to 12 or 14. (Western Districts.)*

(a) Tulbagh Div.—Piquetberg Road Station (2 examples, *R. M. Lightfoot*); Waterfall Mountains, near Tulbagh Road Station (2 ex., *R. M. Lightfoot*, *F. Treleaven*).

(b) Worcester Div.—Slanghoek (49 ex., *R. Francke*, *W. F. Purcell*); village of Worcester (18 ex., *R. M. Lightfoot*, *I. Meiring*, *W. F.*

* *Penther* records it from Mossel Bay, Port Elizabeth, Robinson Pass (north of Mossel Bay Div.), Grahamstown, and the Div. of Albany. The locality "West Africa," given by some authors, is doubtless founded on mistaken identification.

Purcell); Brandvlei (12 ex., *I. Meiring, W. F. Purcell*); Hex River Valley (12 ex., *F. Treleaven*); Triangle (1 ex., *R. M. Lightfoot*); Touws River Station (12 ex., *Dr. W. P. Le Feuvre, W. F. Purcell*); Rabiesberg, near Nuy River Station (20 ex., *R. Francke, W. F. Purcell*).

(c) Robertson Div.—Village of Robertson (8 ex., *Dr. R. J. M. Melle, W. F. Purcell*); Ashton (4 ex., *E. de Wet, W. F. Purcell*).

(d) Caledon Div.—Houw Hoek (9 ex., *W. L. Slater, W. F. Purcell, Mrs. W. F. Purcell*); village of Caledon (35 ex. from the Venster Ravine, *Mr. and Mrs. Ewald Watermeyer, Mrs. W. F. Purcell, C. L. Leipoldt, W. F. Purcell*); River Zonder Einde (1 ex., *W. F. Purcell*).

(e) Bredasdorp Div.—Village of Bredasdorp and Marcus Bay (5 ex., *H. A. Fry*).

(f) Swellendam Div.—Avontuur, near Storms Vlei (*Mrs. W. F. Purcell*); Bonnie Vale at Bushmans Drift on Breede River (*Ch. Groom*).

(g) Mossel Bay Div.—Town of Mossel Bay (56 ex., *J. L. Drège, W. F. Purcell*).

(h) Prince Albert Div.—Village of Prince Albert (2 ex., *W. F. Purcell*). One of these, an ad. ♀, differs from all other specimens in the Collection in having the granules of the superior accessory crests of fifth caudal segment much higher than usual, distinctly conical and almost pointed, and the posterior tooth of the superior crests in segments 2–4 long and rather pointed.

B. *With the movable finger normally with 14 anterior flanking teeth, varying in some specimens to 13 or 15. (Eastern Districts.)*

(i) Uitenhage Div.—Dunbrody, on the Sundays River (10 ex., *Rev. J. A. O'Neil*); Coega (1 ex., *J. L. Drège*).

(j) Port Elizabeth (16 ex., *J. L. Drège, H. A. Spencer*).

(k) Albany Div.—Brakkloof, near Grahamstown, 7 ♀, 7 ♂, and 13 juv. from Dr. Schönland of the Albany Museum (coll. by Mrs. George White); number of pect. teeth in ♀ 28–33, in ♂ 33–36.

The principal feature of *capensis* is the thinness of the hand in the ad. ♂. In almost all the other species of the genus the hand is more or less strongly incrassated in the adult of this sex, and the statement that this is also the case in *capensis*, made by several previous authors, is a mistake, doubtless due to the confusion of several species. I have never observed the upper surface of the tibia of the pedipalps quite smooth, but as the granulation here is often very weak, this may possibly sometimes be the case.

1β. PARABUTHUS CAPENSIS var. FRENCHI, nov.

A number of specimens, apparently differing from *capensis* solely in the shape of the shagreened area on the second caudal segment, represents a local variety of *capensis*, inhabiting an area to the north-east of that in which the principal form has hitherto been found.

The shagreened area of the second segment forms a short, oval, and often rather deep depression, about $1\frac{3}{4}$ times as long as wide, and occupying slightly more than half the upper surface. At the hind edge of the upper surface a tiny shagreened area occurs in some specimens, and in one case this is almost connected with the anterior area by a few isolated granules scattered along the median line. Movable finger with 13-14 anterior flanking teeth, the main rows as in *capensis*.

(a) Types, 1 ♂ and 4 ♀ (all adult) from Graaff Reinet (*Geo. French*) (Reg. No. 5207), and 1 juv. from the same locality (*C. L. Leipoldt*); number of pectinal teeth in ♀ 32-35, in ♂ 40; length of largest ♀ 70, of ♂ 70.

(b) 1 ♂ and 1 ♀ from Burgersdorp, presented by Dr. Schönland of the Albany Museum, in which are a number of other specimens from the same locality. These agree with the specimens from Graaff Reinet, except that I did not notice the tiny shagreened area near the hind edge of second caudal segment. Length of ♀ 77, of ♂ 60; number of pect. teeth in ♀ 31-33, in ♂ 36.

This variety was first collected by Mr. French, after whom it has been named.

2. PARABUTHUS CALVUS Purc.

1898. *P. c.*, Purcell, Ann. S. A. Mus., v. 1, p. 28, pl. iv., fig. 7. ♂.

Besides the typical ♂ we have a ♀ specimen from Clanwilliam Div., which differs in being much more granular and in having a narrower tail. This may perhaps be a different species.

In the type the upper surface of the first caudal segment is wider than long, but the shagreened area is narrower than in *capensis* and only slightly widened in its anterior portion, which is only $\frac{2}{3}$ as wide as the upper surface of the segment. In the second segment the length of the upper surface is equal to its width and the shagreened area is parallel-sided, except for a slight posterior constriction, and a little more than three times as long as wide. The movable finger has 14 anterior flanking teeth and the main rows in the middle third of the finger are composed of 7-9 teeth.

The following are some supplementary measurements, omitted in

the previous description of the ♂ :—Length and width of first caudal segment 5, $6\frac{1}{4}$, of second $5\frac{3}{8}$, $6\frac{1}{4}$, of third $5\frac{3}{4}$, $6\frac{1}{5}$, of fourth $6\frac{1}{2}$, $5\frac{3}{4}$, of fifth 7, $5\frac{1}{4}$, of sixth $6\frac{3}{8}$, $4\frac{1}{4}$; height of first $4\frac{1}{3}$, of fourth $4\frac{3}{4}$, of fifth $4\frac{1}{2}$ (this height was by mistake given as $3\frac{3}{8}$ in the original description); length of upper surface of first segment $3\frac{1}{2}$, width of this surface in its middle $3\frac{3}{4}$.

§ B.—*Species in which the hand in the ad. ♂ is more or less incrassated, exceeding the tibia of the pedipalp in width and thicker than in the ♀ and young.*

3. PARABUTHUS BREVIMANUS (Thor.).

1877. *Buthus b.*, Thorell, Atti Soc. ital., v. 19, p. 110.

1891. *Heterobuthus b.*, Kraepelin, Mitth. Mus. Hamburg, v. 8, p. 69.

1899. *Parabuthus b.*, Kraepelin, Das Tierreich, Scorp. and Pedip., p. 32.

? 1901. *P. cristatus*, Pocock, Ann. Mag. N. H. (7), v. 7, p. 284. ♀.

Both sexes of this species have been minutely described by Thorell.

The South African Museum possesses only male specimens, viz., 1 from Zandhoogte, near Ramonds Drift on the Orange River (Little Bushmanland), and 1 from near Naroep (Great Bushmanland), both places in Namaqualand Div. (spirit specimens, *Max Schlechter*); also, an old dried ♂ specimen, labelled “Damaraland” (*F. Hodgson*). The dried specimen measures 33 mm. in length, the 2 spirit specimens $36\frac{1}{2}$ mm. and 41 mm., while Thorell’s ♂ measured 42 mm. and his ♀ 50 mm. Pocock’s ♀ of *cristatus* measured 62 mm. in length.

♂. *Colour*.—The recently killed spirit specimens are pale yellow, the abdomen, excepting along the hind margins of the segments, darkened in one specimen; median eye-tubercle and a curved mark on each side, enclosing the tubercle as in brackets, black.

Cephalothorax somewhat wider than long or as wide as long, finely granular throughout, the granulation coarser on the interocular area in the dry specimen; median eyes unusually large and near together, the distance between them only slightly exceeding their diameter, the eye-tubercle finely granular.

Tergites as in *capensis*.

Sternites.—Segments 1–4 granular only at the extreme lateral borders, segment 5 minutely granular throughout or smooth mesially.

Tail moderate, sparsely hairy, the vesicle pilose. Segments 1–5

of equal width (in the dry specimen), or segment 1 or 1 and 5 slightly wider than the others (in Thorell's type the tail becomes slightly narrower posteriorly); segment 5 almost as high as segment 4; vesicle about $\frac{4}{5}$ as wide as the fifth caudal segment.

Segments 1-3 with 10 granular crests, the superior and the upper lateral crests rather weak but generally distinct, the middle lateral crest very weak, sometimes indistinct, the infero-lateral and median crests rather weak in segment 1 but strong and well developed in segments 2-3, the infero-lateral crests in these 2 segments strongly converging posteriorly towards the adjacent median crests, which they almost touch at the hind ends of the segments, the 4 enlarged posterior granules of the 4 crests in segment 3 forming together a characteristic, transverse, broadly U-shaped crest with the upright bars of the U much shorter than its width. In segment 4 only the superior crests are developed, all the others being obliterated by the dense granulation which covers the sides and lower surface. In segment 5 the superior crest is distinct in the anterior fourth or fifth of the segment, the rounded superior edges of which are densely and finely granular like the sides, but provided, however, with a couple of larger granules representing the inner accessory crests of the upper surface; infero-lateral crests of segment 5 distinct, with 2-3 of the posterior teeth enlarged and lobe-like.

Segments 1-5 densely and finely granular on the sides and below, the granulation weak in the anterior, stronger in the posterior segments; under surface of segment 5 without distinct median or accessory crests.

Upper surface of all the caudal segments distinctly grooved along the middle, reticularly granular laterally but shagreened in the middle in segments 1-4, finely and weakly granular in the anterior but smooth in the posterior half of segment 5; from the anterior outer angles of the upper surface a row of granules extends obliquely backwards to meet the outer edge of the shagreened area, giving the latter a *broadly cuneate appearance* in most of the segments; posteriorly the shagreened area is constricted and then widened again at the hind edge in segments 1-2; upper surface of segment 1 about one-half longer than wide in the middle, the crests parallel or slightly converging posteriorly, the anterior edge descending rather suddenly but not quite perpendicularly in the middle.

Vesicle granular, especially at the base below.

Pedipalps in ♂.—Tibia $2\frac{3}{4}$ - $2\frac{3}{4}$ times as long as wide, the anterior and posterior sides parallel in the middle third of the segment; the upper surface finely granular, its anterior crest obsolete or more

or less distinct. Hand about $1\frac{1}{3}$ times as wide as the tibia; fingers short, shorter even than in the type, the proportion of the length of the hand-back to the movable finger being 3 mm.: $3\frac{3}{4}$ mm. in the larger, $2\frac{3}{4}$ mm.: $3\frac{1}{3}$ mm. in the smaller spirit specimen, and 3 mm.: 3 mm. in the dry specimen. (In Thorell's typical ♀ $2\frac{1}{3}$ mm.: $4\frac{1}{2}$ mm.). Movable finger with 11 (rarely 10) anterior flanking teeth, the main rows in the middle third of this finger composed of 3-5 teeth (including the enlarged basal tooth of each row).

Pectines with 26-28 teeth in the ♂ (in Thorell's ♂ specimen 29-30, in his ♀ 24); the posterior basal lamella of the scape normal, not lobate in the ♂ (but produced into a broad lobe behind in the ♀, according to Thorell).

Measurements of largest ♂.—Total length 41; length and width of cephalothorax $4\frac{1}{2}$; distance of eyes from anterior margin 2, from posterior margin $2\frac{1}{3}$; length of femur of pedipalp 4, of tibia 4, of hand-back 3, of movable finger $3\frac{3}{4}$; width of femur 1, of tibia $1\frac{1}{3}$, of hand $1\frac{3}{4}$; length of tail 25, of first caudal segment $3\frac{1}{2}$, of second $3\frac{3}{4}$, of third $3\frac{5}{6}$, of fourth $4\frac{1}{2}$, of fifth $4\frac{1}{3}$, of sixth $4\frac{1}{5}$; width of first and fifth segments $2\frac{1}{5}$, of second, third, and fourth $2\frac{3}{4}$, of vesicle $2\frac{1}{4}$; height of fourth segment $2\frac{1}{4}$, of fifth $2\frac{1}{5}$; length of upper surface of first segment 2, width of this surface in its middle $1\frac{1}{2}$.

This remarkable species is well characterised by the converging inferior caudal crests of segments 2-3, the U-shaped transverse crest of segment 3, the absence of crests from the sides and under surface of segment 4, the large eyes and the short fingers. Its area of distribution, as far as known, includes German South-West Africa and Bushmanland, in the north-west corner of Cape Colony. Pocock has recently described a species under the name *P. cristatus*, in which the second, third, and fourth caudal segments show all the structures characteristic of *brevimanus*. No structural character whatever is mentioned in Pocock's diagnosis, which would distinguish this species from *brevimanus*, but as the locality is stated to be the Congo and the total length 62 mm. it would perhaps be unwise to assume that the species are necessarily identical.

4. PARABUTHUS LÆVIFRONS (Sim.).

1887. *Buthus l.*, E. Simon, Ann. Soc. ent. France (6), v. 7, p. 379. ♀.

1899. *Parabuthus l.*, Kraepelin, Das Tierreich, Scorp. and Pedip., p. 30.

The following description has been made from 3 ♂ with incras-

sated hands (apparently adults, measuring from 49 mm. to 68 mm. in length) and 2 ♀ (64 mm. and 84 mm. in length), all from Namaqualand Div., Cape Colony; also an immature ♂ and ♀, measuring 50 mm. and 44 mm. respectively, from Kenhart Div., Cape Colony.

♂ ♀. *Colour*.—Pale ochraceous; the legs paler sulphur-yellow; the abdomen sometimes slightly darkened; the last 3 caudal segments brown, in places sometimes almost black, the first 3 segments pale ochraceous; ocular tubercle black.

Cephalothorax about as long as broad, its length sometimes slightly exceeding, sometimes slightly less than, the breadth; extending from each side of the median eye-tubercle obliquely forwards and outwards nearly as far as the lateral eyes is a slightly depressed smooth area; the interocular area smooth and polished in the ♀, but granular in the ♂ (weakly granular in the young ♂ and ♀ from Kenhart Div.); rest of the cephalothorax rather finely granular; upper surface almost or quite destitute of hairs; median eye-tubercle quite smooth, broad, the eyes large, the distance between them about 2–2½ times their diameter.

Tergites smooth or nearly so in the ♀ (minutely granular in the ♂) in the anterior part, more coarsely granular in the posterior part, of each of the first 6 segments; seventh segment thickly granular laterally, finely shagreened mesially.

Sternites 1–4 finely granular only at the extreme lateral borders; last segment with a few weak lateral granules, the keels often almost obsolete.

Tail comparatively long and slender, sparsely pilose, the segments gradually decreasing in width from the first to the sixth (♀) or from the second or third to the sixth, the first 2 or 3 segments being then equally wide (♂), the fourth always decidedly narrower than the first; segments 4 and 5 long and low, of almost equal height but sensibly lower than segments 1–3; width of vesicle $\frac{4}{5}$ – $\frac{6}{7}$ that of fifth segment; aculeus very long, longer than the vesicle.

Segments 1–3 with 10 mostly coarsely granular keels, but the 4 inferior keels wholly smooth in segment 1 and smooth anteriorly in segment 2, the middle lateral keels also often smooth in the anterior part. Segment 4 with only 8 strongly developed keels, of which the infero-median ones are abbreviated posteriorly; the middle lateral keel in this segment rudimentary, represented at most by a smooth, barely perceptible ridge anteriorly and a few, mostly weak granules posteriorly. Superior crests in segments 2–4 sometimes with a slightly enlarged but not spiniform posterior tooth; this crest

in segment 4 very regular throughout, not interrupted in the middle ; in segment 5 distinct and well developed only in the anterior fourth of the segment (and occasionally again quite posteriorly), the rest of the rounded, superior, outer edge more or less thickly covered with irregularly arranged granules, the superior accessory crests represented, much as in *capensis*, by an irregular row of low rounded granules, not distinctly demarcated from the rest. Inferior lateral crest in segment 5 with the teeth in the posterior half lobe-like and much enlarged.

Upper surface in anterior segments almost smooth or reticularly granular laterally, very finely and densely shagreened mesially, the upper surface in the posterior segments smooth. Segment 1 flattened above, not grooved mesially, its upper surface considerably longer than wide, with parallel crests, its length a little exceeding twice the width of the shagreened area and about equal to the width of the vesicle ; the shagreened area large, narrower than in *capensis*, almost flat or very slightly concave, occupying in its widest part almost or quite half the width of the upper surface, constricted posteriorly, then widening again ; upper surface descending suddenly (but not quite so perpendicularly as in *capensis*) along the anterior edge of the shagreened area, which projects slightly forwards at the middle. Segment 2 less flattened above, especially posteriorly, its upper surface one-half longer than wide and about four times as long as the width of the shagreened area, with parallel crests ; the shagreened area moderately concave, especially anteriorly, constricted posteriorly, then widened again, longer and narrower than in segment 1, occupying in its widest part only about $\frac{1}{3}$ of the width of the upper surface ; upper surface descending nearly as abruptly as in segment 1 in its mesial part along the anterior edge of the shagreened area. Segments 3-5 deeply grooved mesially, the groove finely granular in segment 3 and sometimes also in segment 4, but smooth in segment 5.

Upper part of lateral surface more or less finely granular in segments 1-3, the rest of the lateral and the inferior surface smooth between the keels in these segments ; segment 4 granular posteriorly, but smooth anteriorly on the sides and below ; ventral surface of segment 5 with a number of minute and some coarse conical granules, which do not, however, form defined secondary crests, the median crest strong, formed of a row of coarse conical granules ; sides of segment 5 smooth along the middle, but with some large and small granules along the lower part.

Pedipalps.—Tibia thick, its anterior side strongly prominent, its

length along upper side just about double its width at base of large anterior tooth; the posterior surface and generally also the posterior part of the upper surface quite smooth; the rest of the superior surface finely but often weakly granular, with well-developed anterior crest.

Hand stout and strongly convex anteriorly in both sexes, its width slightly exceeding that of the tibia in the ♀ and young ♂ but considerably exceeding it (by about one-third) in the ad. ♂; the length of the tibia, therefore, sub-equal to (or slightly exceeding) twice the width of the hand in the ♀ and young ♂, and a little more than $1\frac{1}{2}$ times this width in the ad. ♂. Length of movable finger in ♀ about $1\frac{2}{3}$, in ad. ♂ about $1\frac{1}{3}$ times the length of the hand-back; this finger normally with 12–13, rarely only 11, anterior flanking teeth, the main rows in the middle third of the finger composed of 4–7 teeth (including the enlarged basal tooth of each row); in the oblique rows of 3 enlarged teeth on both fingers the anterior tooth is distinctly distal to the line joining the middle and posterior one in the ♂, but to a lesser extent (sometimes scarcely at all) in the ♀.

Legs.—Femora weakly granular externally, tibiæ smooth, sometimes very weakly granular in ♂.

Pectines with 33–35 teeth in the ♀ and 39–41 teeth in the ♂, the posterior basal lamella of the scape enlarged and produced into a broad lobe behind in the ♀, normal in the ♂.

Measurements of largest ♀.—Total length 84; length of cephalothorax 10, width 10; distance of eyes from anterior edge 4, from posterior edge $5\frac{1}{2}$; length of femur of pedipalp 7, of tibia $7\frac{1}{2}$, of hand-back 4, of movable finger 8; width of femur $2\frac{1}{4}$, of tibia $3\frac{1}{2}$, of hand 4; length of tail 52; length and width of first caudal segment 7, $5\frac{1}{3}$, of second $7\frac{3}{4}$, $5\frac{1}{3}$, of third 8, $5\frac{3}{4}$, of fourth $8\frac{1}{2}$, $5\frac{1}{3}$, of fifth $9\frac{3}{4}$, $5\frac{1}{3}$, of sixth 10, $4\frac{2}{3}$; height of first segment $4\frac{1}{3}$, of third 5, of fourth $4\frac{1}{3}$, of fifth $4\frac{1}{4}$; length of upper surface of first segment $4\frac{1}{3}$, width of this surface in its middle $3\frac{1}{2}$.

Of largest ♂.—Total length 68; length and width of cephalothorax $7\frac{1}{2}$; distance of eyes from anterior edge $2\frac{1}{3}$, from posterior edge 4; length of femur of pedipalp $5\frac{1}{2}$, of tibia 6, of hand-back nearly 5, of movable finger $6\frac{1}{2}$; width of femur $1\frac{1}{3}$, of tibia almost 3, of hand 4; length and width of first caudal segment $5\frac{1}{3}$, $4\frac{3}{4}$, of second 6, $4\frac{3}{4}$, of third $6\frac{1}{4}$, $4\frac{2}{3}$, of fourth 7, $4\frac{1}{4}$, of fifth $7\frac{3}{4}$, 4, of sixth $8\frac{1}{4}$, 3; height of first 3 segments $3\frac{1}{3}$, of fourth $3\frac{2}{3}$, of fifth $3\frac{1}{2}$; length of upper surface of first segment $3\frac{3}{4}$, width of this surface in its middle $2\frac{1}{3}$.

Localities.—Namaqualand Div., Cape Colony:—

(a) 1 ♀ from Henkries and 2 ad. ♂ (including the largest) found between Henkries and Wolftoon in Little Bushmanland (*Max Schlechter*).

(b) 1 ad. ♂ from Naroep, Great Bushmanland (*Max Schlechter*).

(c) 1 ♀ (the largest) from Naramoep, Great Bushmanland (*Max Schlechter*).

Kenhart Div., Cape Colony :—

(d) 1 juv. ♀ from Beenbreek on the Orange River, Great Bushmanland (*Max Schlechter*).

(e) 1 juv. ♂ from Pofadder, Great Bushmanland (*E. G. Alston*).

This species is not known to occur south of Bushmanland in Cape Colony. Simon's type-specimen, which was obtained by Dr. Hans Schinz in German South-West Africa, is evidently a ♀, although described as a ♂; its colour is much darker, the caudal segments are subequal in width, and the legs are quite smooth.

The stout hand and tibia of the pedipalps, the elongated tail with the middle lateral crest obsolete on the fourth segment, the smooth interocular area in the ♀, &c., characterise this species very sharply.

5. *PARABUTHUS NEGLECTUS* Purc.

1899. *P. n.*, Purcell, Ann. S. Afr. Mus., v. 1, p. 433.

♂ ♀.—*Colour* as in *capensis*, except that the vesicle is generally slightly darker than the other caudal segments.

Cephalothorax as in *capensis*, except that the anterior half of the upper surface is generally (but not always) provided with a number of hairs; the eye-tubercle sometimes smooth in the groove above.

Tergites and *sternites* as in *capensis*.

Tail rather hairy. Relative width and height of segments 1–6 exactly as given in the description of *capensis*. Crests of segments 1–4 as in *capensis*, except that the superior crest in segment 4 is much more strongly dislocated in its middle, the anterior part being often continued backwards on the outer side of the uppermost portion for a short distance or even along the whole length of the latter. Superior crests of segment 5 as in *capensis*, except that the accessory crests are more distinct, one or more of the granules which compose it being strongly conical and, especially the posteriormost one, often sharply pointed and tooth-like; lateral inferior crests of segment 5 with the posterior teeth enlarged and lobe-like.

Upper surface of caudal segments in most respects exactly agreeing with the description of *capensis*, the differences being (1) the anterior edge of the shagreened area projects convexly forwards in

the middle in segment 2 as well as in segment 1, (2) the shagreened area in segment 2 is broadly and somewhat deeply excavated in its anterior two-thirds, (3) the posterior edge of segment 2 is *strongly elevated and curved forwards* in the middle above, forming a very characteristic tongue-like elevation, also developed although less strongly in segment 3.

Lateral and under surfaces densely and in the posterior segments coarsely granular between the keels, except in the anterior part of segments 1-3 where they are more or less smooth; granulation on under side of segment 5 coarser than in *capensis*, very uneven, the larger granules strong and conical but not forming distinct secondary crests, the median crest as in *capensis*. Vesicle coarsely granular below and on the sides.

Pedipalps.—Tibia stout, its anterior side strongly prominent a little proximal to the middle; length of tibia along upper side in the ♀ $2\frac{1}{6}$ – $2\frac{1}{4}$, in the ad. ♂ $2\frac{1}{4}$ – $2\frac{1}{3}$ times its width at the base of the large anterior tooth; upper surface finely granular, with its anterior crest obsolete or only partially developed; the posterior surface smooth or nearly so.

Hand stout, its width somewhat exceeding that of the tibia in the ♀ and juv. ♂ and considerably exceeding it (by about one-third) in the ad. ♂; the length of the tibia sub-equaling (or slightly exceeding) twice the width of the hand in the ♀ and nearly or quite $1\frac{2}{3}$ times this width in the ad. ♂. Length of movable finger in ♀ $1\frac{3}{4}$ – $1\frac{5}{6}$, in the ad. ♂ $1\frac{1}{3}$ – $1\frac{1}{2}$ times as long as the hand-back. In not quite adult males the hand is scarcely thicker than in the ♀. Movable finger with 13 (rarely 12 or 14) anterior flanking teeth, the main rows in the middle third of the finger composed of 4–7 teeth (including the enlarged basal tooth of each row).

Legs.—External surface of femora and tibiae finely granular, or the tibiae nearly smooth.

Pectines with 32–36 teeth in the ♀ and 34–39 in the ♂, the posterior basal lamella of scape produced into a broad lobe behind in the ♀, merely angular in the ♂.

Measurements of a ♀.—Total length 91; length of cephalothorax $9\frac{1}{2}$, width 10; distance of eyes from anterior margin 4, from posterior margin $4\frac{3}{4}$; length of femur of pedipalp $6\frac{1}{2}$, of tibia 7, of hand-back $4\frac{1}{4}$, of movable finger $8\frac{1}{2}$; width of femur $2\frac{1}{2}$, of tibia $3\frac{1}{2}$, of hand $3\frac{1}{2}$; length of tail $52\frac{1}{2}$; length and width of first caudal segment $6\frac{2}{3}$, $6\frac{2}{3}$, of second $7\frac{3}{4}$, $6\frac{2}{3}$, of third $7\frac{3}{4}$, $6\frac{2}{3}$, of fourth $8\frac{1}{2}$, $6\frac{1}{2}$, of fifth 10, $5\frac{3}{4}$, of sixth $9\frac{1}{2}$, 5; height of fourth segment $5\frac{1}{2}$, of fifth (not including superior teeth) $4\frac{3}{4}$; length and width of upper surface of first segment $4\frac{1}{2}$.

Of a ♂.—Total length 73; length of cephalothorax $7\frac{3}{4}$, width 8; distance of eyes from anterior margin $3\frac{1}{4}$, from posterior margin 4; length of femur of pedipalp $6\frac{1}{4}$, of tibia $6\frac{1}{2}$, of hand-back 5, of movable finger 7; width of femur 2, of tibia $2\frac{2}{3}$, of hand $3\frac{1}{5}$; length tail $45\frac{1}{2}$; length and width of first caudal segment $5\frac{3}{4}$, $5\frac{3}{4}$, of second, $6\frac{1}{4}$, $5\frac{1}{5}$, of third $6\frac{1}{2}$, $5\frac{1}{5}$, of fourth $7\frac{1}{3}$, $5\frac{2}{3}$, of fifth $8\frac{1}{4}$, 5, of sixth 9, $4\frac{1}{4}$; height of fourth segment $4\frac{3}{4}$, of fifth (not including superior teeth) $4\frac{1}{2}$; length and width of upper surface of first segment $3\frac{3}{4}$.

Locality.—The above description has been taken from 18 ♀ (about 9 ad.) and 14 ♂ (3 ad.) from Clanwilliam and Calvinia Div. (collected by Mr. Max Schlechter on the road between Pakhuis Berg and Oorlogs Kloof).

In addition to these the Museum possesses a number of other specimens from the western Divs. of Cape Colony, making a total of 118 specimens in all, which agree with the above description in almost every respect. The largest ♂ and ♀ (from Concordia, *J. H. C. Krapohl*) measured 86 mm. and 111 mm. respectively. The pectinal teeth vary from 32–37 in the ♀ and from 34–41 in the ♂. Occasionally the posterior surface of the tibia of the pedipalp is finely granular. The movable finger has normally 13 anterior flanking teeth, varying in some specimens to 12 or 14.

The additional localities are:—

(b) Tulbagh Div. — 1 ♀ from Waterfall Mountains, near Tulbagh Road Station (*J. P. Cregoe*); 1 ♀ and 1 juv. from Piquetberg Road Station (*R. M. Lightfoot*).

(c) Worcester Division.—1 juv. from Touws River Station (*W. F. Purcell*).

(d) Clanwilliam Division.—3 ad. ♂, 1 ♀ and 9 juv. from Olijvenbosch Kraal and Onder Berg Vlei in the valley of the Berg Vlei River, north of the Piquetberg Range (*C. L. Leipoldt*); 1 ex. from Blikhuis, south of Clanwilliam, 1 ♀ from Keurbosch Kraal and 1 ad. ♂ from near Pakhuisberg, both in the Cedar Mountains (*R. M. Lightfoot*); 1 juv. from Rondegat, south of Clanwilliam, and 6 juv. from Boontjes River, near Pakhuis Berg (*Max Schlechter*).

(e) Calvinia Division.—2 ad. ♂, 2 ♀ and 3 juv. from Nieuwoudtville and elsewhere in the Onder Bokkeveld (*Max Schlechter*, *C. L. Leipoldt*).

(f) Namaqualand Division.—7 ad. ♂, 9 ♀, and 24 juv. from Garies, Concordia, Ookiep, Steinkopf, and Hartebeest Fontein (*L. Péringuey*, *W. H. Turle*, *M. Schlechter*, *L. Mally*, *Dr. R. H. Howard*, *J. H. C. Krapohl*). These include much the largest specimens in the Collection. In some the lateral surface of the fifth

caudal segment is less thickly granular than usual, being sparsely granular, or even occasionally almost smooth, along the middle.

(g) 1 ad. ♂ from Agennys, Great Bushmanland, Namaqualand Division (*M. Schlechter*), differing from all the other specimens in having the first 3 caudal segments pale ochraceous and the last 3 segments brown. The movable finger is rather short, being only $1\frac{1}{4}$ times the length of hand-back.

(h) 1 ♀ (half-grown) from Great Namaqualand, German South-West Africa (*Dr. R. Marloth*), with the superior surface of tibia of pedipalp almost smooth, except along anterior margin.

The head-quarters of this species in Cape Colony appear to be in Clanwilliam Division, the western part of Calvinia Division, and the higher mountainous parts of Namaqualand Division, all of which tracts are very dry but have winter rains. Southwards the species extends into the territory of *P. capensis* in the Divisions of Tulbagh and Worcester, where, however, only a few isolated specimens have as yet been found. Northwards it extends into Great Bushmanland, where it is very rare indeed, being here replaced by *villosus*, *schlechteri*, &c.

P. neglectus is a very distinct species, and is easily recognisable by the tongue-like elevation on the second and third caudal segments, the very large shagreened area on the first and second segments, and the stout tibia of the pedipalp.

The Museum also possesses two apparently immature specimens, which are almost entirely black or brownish black in colour, only the tarsi and fingers being pale. These were found by Mr. C. L. Leipoldt at Onder Berg Vlei, together with a number of typical yellow specimens of *neglectus* (see above under *d*). Except that the tail is slightly narrower than is the case in yellow specimens of the same size, these black specimens do not appear to differ structurally from *neglectus*.

6. PARABUTHUS VILLOSUS (Peters).

1863. *Prionurus v.*, Peters, Monatsber. Ak. Berlin, 1862, p. 26.

1877. *Buthus v.*, Thorell, Atti Soc. ital., v. 19, p. 103.

1889. *Buthus v.*, Pocock, Ann. Mag. N. H. (6) v. 3, p. 343.

1895. *Parabuthus v.*, Pocock, J. Linn. Soc., v. 25, p. 316, pl. 9, figs. 6a, 6b.

1899. *Parabuthus v.*, Kraepelin, Das Tierr., Scorp. & Pedip., p. 31.

The following description was made from 15 specimens from

Naroep, but it applies equally well to the other examples from Bushmanland enumerated below.

♂ ♀. *Colour*, including that of under surface, varying from a rich dark brown to black or greenish black, the fingers and also often the manus of pedipalps and the distal parts of the legs lighter brown; third sternite of abdomen generally with a wide, triangular, pallid mark.

Pubescence generally dense on the limbs, the sides and under surface of tail, the hind margins of the abdominal tergites, and the surface of the last abdominal sternite; the hairs reddish yellow, particularly long on the tail but short and velvety on the fingers of the pedipalps.

Cephalothorax more depressed and relatively wider than in the other species of the genus; the granulation of the upper surface dense, especially coarse in the large specimens, the oblique depressed area on each side of the median eye-tubercle well marked, with much finer and, especially in the ♀, sparser granulation; median eye-tubercle broad, granular before and behind and generally also in the groove above, the eyes small, their distance apart at least 3 and often nearly 4 times their diameter.

Tergites 1-6 finely granular in their anterior, more coarsely granular in their posterior part; segment 7 coarsely granular laterally but broadly shagreened mesially.

Sternites.—Segment 1 finely granular laterally but smooth mesially in ♀ and juv. ♂, finely granular throughout or more or less smooth behind in the middle in the ad. ♂; segments 2-5 granular at lateral and especially at lateral anterior borders in the ♀, more extensively granular laterally and sometimes also very minutely granular mesially in the ad. ♂; last segment granular laterally and, in the ♂, sometimes also mesially.

Tail stout, the segments successively and regularly decreasing in width from the first to the fifth, the first always considerably wider than the fourth; fifth segment high, the first intermediate in height between the fourth and the fifth (not including the superior teeth) or equal to the fourth; vesicle very large, its width from $\frac{2}{3}$ to almost equal that of the fifth segment at the widest part of the latter, the posterior part of this segment being generally equal to, but sometimes slightly greater or less than the vesicle in width.

Segments 1-4 with 10 strong granular keels, those on the under side of segment 1 generally more or less smooth anteriorly, the infero-median keels of segment 4 abbreviated posteriorly and often irregular and scarcely distinguishable in the coarse granulation of the under

surface. The superior crests mostly with an enlarged and often sharply pointed posterior tooth; superior crests of segment 4 sometimes single and continuous throughout, but generally more or less distinctly duplicated in its posterior half, the double crests very close together; superior crests in segment 5 strong and continuous throughout the whole length of the segment, sometimes slightly weaker in the middle, the accessory superior crest very distinct, composed of 2-4 large, sharp, conical teeth. Teeth of infero-lateral crests in segment 5 often scarcely or not at all enlarged posteriorly.

Upper surface in all the segments reticularly raised, but otherwise smooth laterally (except for a couple of isolated granules in segment 1) but finely shagreened mesially in the anterior and smooth in the posterior segments. Upper surface of segment 1 flattened, or very slightly hollowed out from side to side posteriorly, not grooved mesially, a little longer than wide in the middle, the crests sub-parallel or slightly converging posteriorly; the shagreened area very large, almost flat or only slightly concave, occupying at its widest part slightly more than half the width of the upper surface, constricted posteriorly and then widening again, its length almost exactly equal to twice its greatest width; anterior edge of shagreened area projecting a little forwards in the middle, not so broad as in *capensis*, being somewhat less than half the width of the upper surface, which descends suddenly and perpendicularly along this edge. Segment 2 with the upper surface flattened laterally but provided in its anterior two-thirds with a deep, oval, shagreened depression; the shagreened area occupying only about $\frac{1}{3}$ of the width of the upper surface, 2-3 times as long as wide, quite absent from the posterior third of the upper surface, which is slightly depressed but not mesially grooved posteriorly; anterior edge descending suddenly and perpendicularly or nearly so in the middle. Segments 3-5 mesially grooved, the groove finely granular anteriorly in segment 3, smooth in segment 5.

Sides and under surface sparsely granular in the anterior and more densely and coarsely granular in the posterior caudal segments; under surface of segment 5 densely and very coarsely granular throughout, the median and accessory crests being mostly entirely indistinguishable; the sides of segment 5 granular throughout or more or less smooth in the upper part; vesicle coarsely granular below.

Pedipalps.—Upper surface of tibia almost smooth, with the anterior crest indistinct or absent; the anterior side of tibia rather prominent, especially in the ad. ♂, the length along the upper side in the ♀ $2\frac{2}{3}$ - $2\frac{3}{4}$, in the ad. ♂ $2\frac{1}{8}$ - $2\frac{1}{3}$ times its width.

Hand in the ♀ and juv. ♂ rather slender, its width less than that of the tibia in the ♀ and equalling it in the juv. ♂, but stout and about $1\frac{1}{4}$ – $1\frac{1}{3}$ times the width of the tibia in the ad. ♂. Length of movable finger in the ♀ about $2\frac{1}{5}$, in the nearly mature ♂ nearly twice, and in the ad. ♂ only about $1\frac{1}{2}$ times as long as the hand-back; the movable finger with generally 15 but often only 14 anterior flanking teeth; the main rows in the middle third of the fingers composed of 5–7 teeth (including the enlarged tooth at the base of each row).

Legs finely granular externally, or the tibiae almost smooth.

Pectines.—No. of pect. teeth in ♀ 36–41, in ♂ 38–42; posterior basal lamella of scape produced into a broad lobe behind in the ♀, normal in the ♂.

Measurements of largest ♀.—Total length 128; length of cephalothorax 15, width 18; distance of eyes from anterior margin $6\frac{3}{4}$, from posterior margin 8; length of femur of pedipalp $11\frac{3}{4}$, of tibia 12, of hand-back $6\frac{1}{2}$, of movable finger $14\frac{1}{2}$; width of femur 4, of tibia 5, of hand $4\frac{2}{3}$; length of tail 79; length and width of first caudal segment $10\frac{1}{4}$, 10, of second $11\frac{1}{2}$, $9\frac{3}{4}$, of third $11\frac{1}{2}$, $9\frac{1}{3}$, of fourth $12\frac{1}{4}$, 9, of fifth $14\frac{1}{4}$, $8\frac{2}{3}$, of sixth 15, $8\frac{1}{2}$; height of fourth segment $7\frac{1}{2}$, of fifth (not including superior teeth) $7\frac{1}{4}$; length of upper surface in first segment $6\frac{1}{2}$, width of this surface in its middle 6.

Of largest ♂.—Total length 108; length of cephalothorax 13, width $14\frac{3}{4}$; distance of eyes from anterior margin $5\frac{2}{3}$, from posterior margin $6\frac{2}{3}$; length of femur of pedipalp $10\frac{1}{4}$, of tibia $10\frac{3}{4}$, of hand-back 7, of movable finger $11\frac{3}{4}$; width of femur $3\frac{1}{2}$, of tibia $4\frac{1}{2}$, of hand 6; length of tail 68; length and width of first caudal segment 9, $9\frac{1}{3}$, of second 10, 9, of third 10, $8\frac{1}{3}$, of fourth 11, $8\frac{1}{3}$, of fifth 12, 8, of sixth $12\frac{1}{3}$, 7; height of fourth segment $7\frac{1}{2}$, of fifth (not including superior teeth) 7; length of upper surface of first segment 6, width of this surface in its middle $5\frac{1}{3}$.

Localities in Cape Colony.—(a) 10 ♂ (8 ad.) and 5 ♀ (varying from 92–128mm. in length) from Naroep, Great Bushmanland, Namaqualand Div. (*Max Schlechter*). The ad. ♂ (with incrassated hands) measured from 92–108mm. in length, while the largest immature ♂ (with slender hands) was 94mm. long.

(b) 1 juv. ♂ from Ramonds Drift on the Orange River, Little Bushmanland, Namaqualand Div. (*Max Schlechter*).

(c) 1 large immature ♂ (100mm. long) from Beenbreek on the Orange River, Great Bushmanland, Kenhart Div. (*M. Schlechter*).

(d) An ad. ♂ and ♀ from Pella, Great Bushmanland, Kenhart Div. (*Max Schlechter*).

(e) A very young specimen from Namies, Great Bushmanland, Kenhart Div. (*M. Schlechter*); fingers and base of aculeus pale yellow.

In the Museum are also the following specimens from German South-West Africa:—

(f) 2 large ♀ stated to have come from Great Namaqualand (*Dr. R. Marloth*). Differ from the Bushmanland specimens in having the sides and under surface of the cauda more thickly granular (the distribution of the granulation closely resembling that of *neglectus*), the infero-median crest of segment 5 more or less distinct, the second caudal segment grooved mesially above, its shagreened area reaching to near hind margin, the movable finger with 16 anterior flanking teeth.

(g) 1 ad. ♂ (old dried specimen) labelled "Walfish Bay," Damara-land (*Carrington Wilmer*). Median crest of fifth caudal segment more or less distinct, shagreened area of second segment as in the Bushmanland specimens, hand very stout, $1\frac{1}{2}$ times as wide as the tibia, movable finger with 16 anterior flanking teeth.

P. villosus is distributed along the west coast of Africa between the Congo and Benguela in the north (*teste* Pocock) and Bushmanland in Cape Colony in the south. In all specimens from this wide area the first caudal segment has been found to considerably exceed the fourth in width, this being the case in all our specimens, in Thorell's, and in Pocock's from the Congo and Benguela. This character may, therefore, be regarded as a constant one for the species, and to it may be added the uniformly dark colouration, the dense pubescence, and the very wide vesicle.

7. PARABUTHUS TRANSVAALICUS Purc.

1899. *P.t.*, Purcell, Ann. S. Afr. Mus., v. 1, p. 434.

♀. *Colour* dark olive-green to nearly black, the tail for the most part dark brown between the keels, the legs and pedipalps dark brown to nearly black, the fingers and the distal portions of the legs yellowish; ventral surface of abdomen much paler, yellowish or yellowish brown, the pectines pale yellow.

Cephalothorax much broader than long, densely and, in the large ♀, rather coarsely granular throughout, the anterior half of upper surface often with a number of hairs as in *neglectus*, the eye-tubercle of moderate size, granular, the superciliary ridges smooth, the eyes rather small, the distance between them $2-2\frac{1}{2}$ times their diameter.

Tergites 1-6 densely and finely granular in the anterior, more coarsely granular in the posterior parts of the segments, segment 7 finely shagreened mesially between the inner keels, coarsely granular laterally.

Sternites as in the ♀ of *capensis*, the last segment granular laterally.

Tail stout, sparsely pilose; segments 1-4 subequal, or segments 1-3 increasing successively but very slightly in width, segment 4 slightly wider than segment 1; segment 5 high, segment 1 nearly as high as segment 4 but higher than segment 5; vesicle large, its width $\frac{2}{3}$ that of fifth segment.

Segments 1-4 with 10 very strong, coarsely granular crests, the infero-median crests smooth anteriorly in segment 1 but abbreviated or irregular posteriorly in segment 4, the middle lateral crest in segment 4 strong. Superior crests in segments 2-3 with an enlarged, sharply pointed, subspiniiform, posterior tooth; these crests in segment 4 dislocated or more or less distinctly doubled in the middle, 2 or 3 of the posterior teeth much enlarged and subspiniiform; superior crests in segment 5 as in *villosus*, distinct and strongly developed throughout, the accessory superior crest very conspicuous, composed of 2-3 very large, subspiniiform, posterior teeth and 1-2 smaller anterior ones. Infero-lateral crests of segment 5 with 1 or 2 of the posterior teeth somewhat enlarged and lobe-like.

Upper surface in anterior segments somewhat reticularly granular laterally, densely shagreened mesially. Segment 1 less flat above than in *villosus*, lightly hollowed out from side to side, especially posteriorly, shallowly grooved mesially almost as deeply as in segments 2-4; the upper surface longer than wide in the middle; the superior crests distinctly converging posteriorly; the shagreened area moderately large, lightly concave throughout its length, which is about $2\frac{1}{3}$ - $2\frac{3}{4}$ times its greatest width, the latter occupying about $\frac{2}{5}$ of the width of the upper surface; posteriorly the shagreened area is slightly constricted, then widened again, its anterior edge is narrow, and the upper surface descends less abruptly than in *capensis* and not quite perpendicularly. Segment 2 grooved mesially above throughout its length as deeply as in segments 3 and 4; the upper surface as long as or slightly longer than wide in its middle; the superior crests almost parallel; the shagreened area occupying the groove, almost as large as in segment 1 and similar in outline, reaching hind edge of the segment, its length $2\frac{1}{2}$ - $2\frac{3}{4}$ times its width, which at the widest part occupies about $\frac{2}{3}$ of that of the upper surface; anterior edge as in segment 1. The superior groove finely granular

in segment 3, bordered on each side by a patch of rather coarse granulation in segment 4, smooth in segment 5.

Lateral and under surfaces of all the segments thickly and for the most part coarsely granular, especially in the posterior segments, segment 5 being thickly covered throughout at the sides and below with finer and coarser granules, the infero-median crest very distinct and regular in this segment, but the accessory crests not distinct vesicle coarsely granular below.

Pedipalps.—Femur finely granular above. Tibia moderate, its upper surface finely granular and with the anterior crest rudimentary but traceable, the posterior surface smooth, the length of tibia along upper side $2\frac{1}{2}$ times its width. Hand slender, its width slightly less than that of the tibia; length of movable finger about $2\frac{1}{3}$ times that of hand-back; movable finger with 16 anterior flanking teeth, the main rows in the middle third of the finger with 6–7 teeth (including the enlarged basal tooth of each row).

Pectines with 32–35 teeth, the posterior basal lamella of scape produced behind into a broad lobe in the ♀.

Legs.—Femora finely granular externally, tibiae weakly granular or almost smooth.

Locality.—1 large and 4 smaller ♀ from the Transvaal, kindly lent to me for description by Dr. J. W. B. Gunning, of the Pretoria Museum. Two of these specimens are in the South African Museum.

Measurements of largest ♀.—Total length 92; length of cephalothorax $9\frac{2}{3}$, width 11; distance of eyes from anterior margin $4\frac{1}{5}$, from posterior margin 5; length of femur of pedipalp $7\frac{1}{4}$, of tibia $8\frac{1}{3}$, of hand-back $4\frac{2}{3}$, of movable finger 10; width of femur $2\frac{3}{4}$, of tibia $3\frac{1}{2}$, of hand $3\frac{1}{5}$; length of tail 53; length and width of first caudal segment 7, $7\frac{1}{2}$, of second $7\frac{2}{3}$, $7\frac{2}{3}$, of third $7\frac{3}{4}$, $7\frac{3}{4}$, of fourth $8\frac{2}{3}$, $7\frac{2}{3}$, of fifth $9\frac{1}{3}$, 7, of sixth $9\frac{1}{3}$, $5\frac{3}{4}$; height of first caudal segment 6, of fourth (not including superior teeth) $6\frac{1}{2}$, of fifth (not including superior teeth) $5\frac{1}{2}$; length of upper surface of first segment 4, width of this surface in its middle 4.

This species closely resembles *villosus* in general appearance and in the granulation of the tail, but it is much less densely hairy, and the posterior caudal segments are relatively much broader and shorter. It is evidently closely related to the following form.

8. PARABUTHUS SCHLECHTERI Purc.

1899. *P. s.*, Purcell, Ann. S. Afr. Mus., v. 1, p. 434.

The following description was made from 5 ad. ♂ and 3 ad. ♀, besides 1 juv. ♀ and 8 juv. ♂ of various sizes, all from Little and

Great Bushmanland, Cape Colony. Most of these were collected by Mr. Max Schlechter, after whom they have been named in recognition of his valuable services in collecting the rich scorpion-fauna of Bushmanland.

♂ ♀.—*Cephalothorax* broader than long, rather coarsely granular above, the granulation in the depressions which extend obliquely forwards and outwards from each side of the eye-tubercle much finer and generally sparser or even almost absent, especially in the ♀, the median groove also often sparsely granular or almost smooth in front of the eye-tubercle; the anterior half of the upper surface with or without a few conspicuous hairs; eye-tubercle wide, situated only a little before the middle of the cephalothorax, the anterior surface and the groove on the summit sparsely granular in the ♂ but generally smooth or almost smooth in the ♀, the eyes medium-sized, the distance between them from $2\frac{1}{4}$ to nearly 3 (in typical ♀ $3\frac{1}{2}$) times their diameter.

Tergites and *sternites* as in *capensis*, excepting that the granulation on the tergites is coarser.

Tail stout, sparsely pilose, the hairs long, most numerous on the vesicle; anterior segments successively increasing in width from the first to the third, the fourth segment stout, as wide as the third, and always decidedly wider than the first; segment 5 high, segment 1 intermediate between segments 4 and 5 in height; vesicle large, its width $\frac{3}{4}$ — $\frac{6}{7}$ that of the widest part of segment 5.

Caudal keels very closely agreeing with the description of those of *transvaalicus*; the enlarged posterior teeth of the superior crests generally very strong, long and sharp, occasionally, however, all of them, including those of the fourth and fifth segments, obtuse and stunted; the superior crests in segment 4 generally merely dislocated and more or less indistinctly doubled for a short distance in its middle but not distinctly doubled throughout the whole posterior part; the superior crests in segment 5 sometimes weaker and slightly irregular, although always distinct, in the middle. Inferior lateral crests in segment 5 with the posterior teeth somewhat enlarged.

Upper caudal surfaces smooth laterally, finely shagreened mesially in the anterior segments. Segment 1 with the upper surface much as in *villosus*, being generally flat (or slightly hollowed out from side to side posteriorly) but not grooved mesially, this surface as long as or slightly longer than wide in its middle; the superior crests parallel or slightly converging posteriorly; the shagreened area moderately large, almost flat, only very slightly depressed, its length about $2-2\frac{1}{4}$ times its greatest width, the latter occupying

about $\frac{1}{2}$ the width of the upper surface; posteriorly the shagreened area is constricted, and then slightly widened again at the hind margin; at its anterior edge the surface descends, as in *transvaalicus*, less abruptly than in *capensis* and not quite perpendicularly. Segment 2 with a moderately large oval excavation occupying only the anterior half of the upper surface, the posterior half of which is shallowly grooved along the middle and quite smooth; the shagreened area small, confined to the anterior concavity, about twice as long as wide, its length only half, its width $\frac{1}{4}$ — $\frac{1}{3}$ times, that of the upper surface. Segment 3 grooved mesially above, the anterior half of the groove deeper and finely granular. Segments 4 and 5 grooved mesially, the groove smooth in segment 5, weakly and very finely granular or almost smooth in segment 4 and not bordered on each side by coarser granules.

Lateral surface in segment 1 granular in its upper part, the inferior surface of this segment smooth or nearly so between the keels; segments 2–3 almost smooth on the sides between the keels or provided with a few coarse granules (occasionally with some very minute and weak reticular granulation in addition), the inferior surface, however, generally more thickly granular between the median keels; segment 4 coarsely and rather thickly granular below, more sparsely granular, sometimes almost smooth, on the sides; segment 5 thickly covered below with fine and coarse granules, the median crest distinct, regularly uniseriate or irregularly granular, the accessory crests indistinct or partially developed; sides of the fifth segment sparsely and coarsely granular in the lower part but generally nearly smooth in the upper part, the surface sometimes with a very minute granulation in addition to the coarse granules. Vesicle coarsely and seriatly granular below.

Pedipalps.—Femur finely granular above. Tibia finely granular above, the anterior crest of upper surface mostly distinct and well developed, sometimes weak and irregular, the length of tibia along upper side in the ♀ $2\frac{2}{3}$, in the ad. ♂ $2\frac{1}{2}$ times its width. Hand slender in the ♀ and juv. ♂, its width slightly less than that of the tibia, but stout and exceeding the tibia in width (by about $\frac{1}{4}$ — $\frac{1}{6}$) in the ad. ♂; length of movable finger in ♀ $2\frac{1}{4}$ — $2\frac{2}{3}$, in ad. ♂ $1\frac{3}{4}$ — $1\frac{5}{6}$ times that of hand-back; movable finger with generally 14 but often with 15 anterior flanking teeth, the main rows in the middle third of the fingers with 5–8 teeth (including the enlarged basal tooth of each row).

Legs with the femora thickly and the tibiae weakly granular externally.

Pectines with 39–45 teeth in the ♀ and 46–51 in the ♂; the posterior basal lamella of the scape produced into a broad lobe behind in the ♀, normal in the ♂.

Measurements of ♀ (type).—Total length 108; length of cephalothorax $11\frac{3}{4}$, width $12\frac{3}{4}$; distance of eyes from anterior margin 5, from posterior margin $5\frac{1}{2}$; length of femur of pedipalp 9, of tibia $9\frac{1}{4}$, of hand-back $4\frac{3}{4}$, of movable finger 11; width of femur 3, of tibia $3\frac{3}{4}$, of hand $3\frac{2}{3}$; length of tail 62; length and width of first caudal segment $7\frac{1}{3}$, 8, of second $8\frac{3}{4}$, $8\frac{1}{4}$, of third $9\frac{1}{5}$, $8\frac{1}{3}$, of fourth $10\frac{1}{2}$, $8\frac{1}{3}$, of fifth 12, $7\frac{1}{5}$, of sixth $11\frac{2}{3}$, $6\frac{3}{4}$; height of fourth segment $6\frac{2}{3}$, of fifth (not including superior teeth) $6\frac{1}{3}$; length of upper surface of first segment 5, width of this surface in its middle $4\frac{1}{4}$.

♂ (from same locality).—Total length 95; length of cephalothorax $10\frac{1}{4}$, width 12; distance of eyes from anterior margin $4\frac{2}{3}$, from posterior margin 5; length of femur of pedipalp 9, of tibia $9\frac{1}{4}$, of hand-back $5\frac{2}{3}$, of movable finger 10; width of femur $2\frac{3}{4}$, of tibia $3\frac{1}{2}$, of hand 4; length of tail 60; length and width of first caudal segment $7\frac{1}{5}$, $7\frac{2}{3}$, of second $8\frac{1}{3}$, 8, of third $8\frac{2}{3}$, $8\frac{1}{4}$, of fourth $10\frac{1}{5}$, $8\frac{1}{4}$, of fifth $11\frac{1}{5}$, 7, of sixth $11\frac{1}{5}$, $5\frac{2}{3}$; height of fourth segment $6\frac{1}{2}$, of fifth (not including superior teeth) 6; length of upper surface of first segment $4\frac{3}{4}$, width of this surface in its middle $4\frac{1}{4}$.

Distance of median eyes from anterior margin in another specimen $4\frac{3}{4}$, from posterior margin $4\frac{5}{6}$.

Localities.—(a) Little Bushmanland: 1 ad. ♀ (type) and 1 ad. ♂ from between Henkries and Wolftoon, Namaqualand Div. (*Max Schlechter*). Legs and pedipalps pale yellow; trunk brownish yellow; tail pale ochraceous, the terminal segments brownish yellow; chelicerae not blackened.

(b) Great Bushmanland: 1 ad. ♀ and 2 juv. from Naroep, Namaqualand Div. (*Max Schlechter*); 1 ad. ♀, 3 ad. ♂ and several juv. from Namies, Zwart Modder, Beenbreek, and Bladgrond, all in Kenhart Div. (*Max Schlechter*); and 2 juv. from Pofadder, Kenhart Div. (*E. G. Alston*). These specimens differ considerably from the types in their darker colouration. The trunk is dark brown to greenish black, the tail yellowish brown to brown, the posterior segments and the vesicle darker brown to olive-green below (in young specimens the whole tail often dark olive-green), legs and pedipalps pale yellow, chelicerae dark olive-green distally.

This species is closely allied to *transvaalicus*, from which it differs principally in having the surfaces of the tail much less thickly granular and the posterior caudal segments more incrassated. It is evidently also closely related to *raudus* (Simon) from German

South-West Africa, from which it appears to differ in having the first caudal segment not deeply grooved above along the middle.

9. *PARABUTHUS GRANULATUS* (H. & E.)

1828. *Androctonus g.*, Hemprich & Ehrenberg, Symb. phys., Scorp., No. 10.

1887. *Buthus fulvipes*, Simon, Ann. Soc. ent. France (6), v. 7, p. 378.

1899. *Parabuthus granulatus*, Kraepelin, Das Tierreich, Scorp. and Pedip., p. 30.

The following description was made from 7 ♂ (5 ad. with incriminated hands) and 6 ♀ (2 or 3 ad.) from Port Nolloth, Steinkopf, and other places in the Div. of Namaqualand (exclusive of Bushmanland), Cape Colony (*L. Péringuey*, Dr. R. H. Howard, W. H. Turle).

♂ ♀. *Colour*.—Trunk and tail pale ochraceous to ochraceous brown, the posterior caudal segments scarcely, if at all, darker than the anterior ones; legs pale yellow; pedipalps pale yellow to ochraceous, finger sometimes darkened at base; chelicerae not reticulated with black.

Cephalothorax much wider than long, densely and rather coarsely granular throughout, and devoid of conspicuous hairs on the upper surface; eye-tubercle situated before the middle, moderate in size, granular in the groove, the superciliary ridges smooth or weakly crenular, the eyes rather small, the distance between them about $2-2\frac{1}{4}$ times their diameter.

Tergites 1-6 each finely granular anteriorly, coarsely granular posteriorly; segment 7 finely shagreened mesially, coarsely granular laterally.

Sternites.—Segment 1 broadly granular laterally under the pectines, especially in the ad. ♂, in which the mesial part is smooth, or very minutely granular also; segments 2-4 granular at extreme lateral borders, and often also behind the spiracles, especially in the ♂, granular also before the spiracles in the ad. ♂; segment 5 more or less coarsely granular laterally in ♂, less granular in ♀, the 4 keels smooth or crenular.

Tail stout, almost hairless; segments 1-3 of equal width and wider than segment 4, or segments 2 and 3 equally wide and slightly wider than segments 1 and 4, segment 4 as wide as or slightly narrower than segment 1; segment 4 high, segment 5 rather low, segment 1 intermediate in height between segments 4 and 5;

vesicle small, its width only about $\frac{2}{3}$ that of the widest part of segment 5.

Segments 1-3 with 10, segment 4 with only 8, strong, coarsely granular keels; the infero-medial keels smooth or weakly crenular in segment 1, more or less abbreviated posteriorly in segment 4; the middle lateral crest in segment 4 rudimentary, except quite posteriorly, very much weaker than the adjacent lateral crests of the same segment; fifth segment often slightly dilated inferiorly, the infero-lateral crests with the teeth much enlarged and lobe-like in the posterior half of the segment; superior crests in segments 2-4 or 3-4 often with an enlarged but not sharply spiniform posterior tooth, these crests in segment 4 perfectly regularly uniseriate throughout, without trace of dislocation or duplication in the middle; the superior crests in segment 5 strong and distinct only in the anterior third or half of the segment, the rounded, superior, lateral edges being smooth or almost smooth posteriorly, but covered in the middle of the segment with low blunt granules, which are continuous with and resemble those on the lateral surfaces; there are no distinct inner accessory crests on the upper surface.

Upper surface of segment 1 not flat but hollowed out from side to side and deeply grooved mesially, not sharply demarcated anteriorly, where it slopes downwards evenly and gradually in the middle, the lateral parts of this surface with some coarse or fine granulation or nearly smooth, the crests slightly converging posteriorly; the shagreened area confined to the deep groove, narrow, occupying less than $\frac{1}{3}$ of the width of the upper surface, its length about 4 times its width. Upper surface in segments 2-5 smooth or sparsely granular laterally, deeply grooved mesially, the groove finely granular anteriorly but smooth posteriorly in segments 2-4, smooth in segment 5.

Anterior segments rather weakly and for the most part sparsely granular between the keels on the lateral and inferior surfaces, segment 1 being almost smooth below; segments 4-5 very densely covered with low, coarse, rounded granules on the whole of the lateral and inferior surfaces, the granulation even, especially on lower surface of segment 5, where there are no traces of accessory crests, the infero-median crest of this segment well developed, uniseriate or indistinctly biseriate.

Pedipalps.—Femur finely granular above. Tibia slender, its length in the ♀ $2\frac{3}{4}$ to nearly 3 times, in the ad. ♂ $2\frac{1}{2}$ - $2\frac{3}{4}$ times its width; the upper surface finely granular or nearly smooth (the latter

being the case especially in the ♀), its anterior crest distinct, with a second, generally less distinct, parallel crest behind it. Hand smooth, but often with traces of a few weak granules anteriorly, slender, its width about equal to that of the tibia in the ♀ and immature ♂, but stout and about $1\frac{2}{3}$ times the width of tibia in the ad. ♂; the length of movable finger in the ♀ about $2\frac{1}{6}$, in the ad. ♂ $1\frac{1}{3}$ – $1\frac{2}{3}$ times the length of the hand-back; movable finger with 16–17 anterior flanking teeth, the main rows in the middle third of the fingers composed of 6–9 teeth (including the enlarged basal one), the anterior flanking granule often situated considerably distal to the line joining the middle and posterior granule of the obliquely transverse rows of 3.

Pectines with 26–31 teeth in the ♀ and with 29–34 in the ♂; the posterior basal lamella of the scape *very similar in both sexes*, the posterior inner angle in the ♂, although rounded, generally more prominent and the posterior edge somewhat longer than in the ♀, the latter edge bearing 1 or at most 2 teeth, which are always elongate and occupy less than half of the posterior side; this lamella in the ♀ bearing 1 or no teeth, the basal pectinal tooth in this sex always strongly abbreviated and generally represented by a short conical or even spherical stump, scarcely distinct from the small fulera at the bases of the teeth.

Measurements of ♀.—Total length 91; length of cephalothorax $10\frac{2}{3}$, width 12; distance of eyes from anterior margin $4\frac{1}{4}$, from posterior margin $4\frac{3}{4}$; length of femur of pedipalp $8\frac{3}{4}$, of tibia 9, of hand-back 5, of movable finger $10\frac{1}{2}$; width of femur $2\frac{1}{2}$, of tibia $3\frac{1}{6}$, of hand $3\frac{1}{6}$; length of tail 59; length and width of first caudal segment $7\frac{3}{4}$, $7\frac{3}{4}$, of second $8\frac{1}{2}$, $7\frac{1}{2}$, of third $8\frac{1}{2}$, $7\frac{1}{2}$, of fourth 10, $7\frac{1}{2}$, of fifth $11\frac{3}{4}$, $6\frac{3}{4}$, of sixth $10\frac{1}{4}$, $4\frac{1}{4}$; height of fourth segment $6\frac{1}{4}$, of fifth $5\frac{1}{3}$.

♂.—Total length 99; length of cephalothorax $10\frac{1}{4}$, width $11\frac{1}{2}$; distance of eyes from anterior margin 4, from posterior margin $5\frac{1}{2}$; length of femur of pedipalp 9, of tibia $9\frac{1}{3}$, of hand-back $6\frac{1}{4}$, of movable finger $10\frac{1}{3}$; width of femur $2\frac{1}{4}$, of tibia $3\frac{1}{3}$, of hand $4\frac{2}{3}$; length of tail 62; length and width of first caudal segment 8, 8, of second $8\frac{2}{3}$, $8\frac{1}{3}$, of third $8\frac{3}{4}$, $8\frac{1}{3}$, of fourth $10\frac{1}{3}$, 8, of fifth $12\frac{1}{2}$, 7, of sixth 11, $4\frac{1}{2}$; height of fourth segment 7, of fifth 6.

A darker variety, apparently identical in colouration with *P. fulvipes* (Sim.) and not differing in structure, except in some unimportant points, from the specimens just described, inhabits Great Bushmanland and adjacent districts to the east. In these the trunk is nearly always dark brown to almost black and generally with a greenish tinge, the posterior caudal segments often darker than the anterior

ones below, the pedipalps ochraceous-brown to blackish brown, the base of the fingers darker, the chelicerae finely reticulated, the legs pale yellow as usual, but the femora at their apex and the tibiae at their base often somewhat infuscated. The difference between the sexes is *well marked* by the structure of the pectines, as the posterior basal lamella of the scape is more angular at its inner hind corner in the ♂ and bears at least 2, often 3 teeth, which occupy at least half of the hind margin (in one juvenile ♂ from Naroep the basal tooth is also reduced to half its normal length). In the ♀ the lamella resembles that of the specimens already described above. Number of pectinal teeth in ♀ 27–31, in ♂ 31–36. Movable finger with 14–15 anterior flanking teeth. These specimens are the following:—

(b) 4 ad. ♂ and 2 juv. ♂ from Naroep, Great Bushmanland, Namaqualand Div. (*Max Schlechter*).

(c) 1 ad. ♂ from Namies, Great Bushmanland, Kenhart Div. (*Max Schlechter*).

(d) 1 ad. ♀ and 1 juv. ♀ from Bladgrond, Great Bushmanland, Kenhart Div. (*Max Schlechter*).

(e) 1 ad. ♀ from Upington on the Orange River, in Gordonia; the hand in this specimen reticularly and weakly granular anteriorly.

(f) 1 ad. ♂ and 1 juv. ♂ from Van Wyks Vlei, Carnarvon Div. (*E. G. and D. C. Alston*); the upper surface of the tail more or less minutely and reticularly granular laterally in all the segments.

The Museum also possesses specimens of *granulatus* from the following localities:—

(g) 1 ad. ♂ from Dunbrody, Uitenhage Div. (*Rev. J. A. O'Neil*); small specimen, 73 mm. long, the movable finger with 15 anterior flanking teeth.

(h) 1 ad. ♂ from the village of Clanwilliam (*C. L. Leipoldt*). This is much the largest specimen in the Collection, its measurements being: Total length 112; length of cephalothorax 12, of tail 70; length and width of first caudal segment $9\frac{1}{4}$, $9\frac{3}{4}$, of second $10\frac{1}{3}$, $10\frac{1}{3}$, of third $10\frac{1}{3}$, $10\frac{1}{3}$, of fourth $11\frac{2}{3}$, 10, of fifth $13\frac{1}{3}$, 9, of sixth $11\frac{1}{2}$, $5\frac{3}{4}$; height of fourth segment 9, of fifth 8. The fourth caudal segment is wider than the first, and the upper surface of segments four and five are more coarsely and densely granular in the lateral parts than is usually the case. Movable finger with 15 anterior flanking teeth.

(i) 2 ad. ♀ from Robertson Div. (*Dr. R. J. M. Melle*). Movable finger with 15–16 anterior flanking teeth.

(j) 1 ad. ♂, the locality of which is stated to be Wagenaars Kraal, Victoria West Div. (*Dr. C. S. Piers*). Movable finger with 14 anterior flanking teeth.

(k) 1 juv. ♀ from Great Namaqualand, German South-West Africa (Dr. R. Marloth). Movable finger with 14 anterior flanking teeth.

Distribution.—This species is not known to be common anywhere in Cape Colony, where its principal locality appears to be the whole of Namaqualand Division and Great Bushmanland. South of Namaqualand it is very rare indeed, but it appears to extend not only over the same area as *neglectus*, but considerably to the east of this as well.

P. granulatus is a very well defined species, its principal characters being the small vesicle, the rudimentary middle lateral crests on fourth caudal segment, the deep groove on first segment, the granulation of the surfaces and superior crests of fourth and fifth segments, the slender brachium, and the absence in the ♀ of a prominent posterior lobe on the basal lamella of the scape of the pectines. The sex of a specimen can often be determined with certainty only by means of the genital stylets.

P. fulvipes (Sim.), from German South-West Africa, is undoubtedly identical with this species, and closely agrees in colouration with specimens from Bushmanland, as does also Pocock's recently described subsp. *fuscus* from the Kalahari, in which, however, the patellæ as well as the femora of the legs are uniformly infuscated (Ann. Mag. N. H. (7), v. 7, p. 285, 1900). *P. pallidus* Poc. from Mombassa is apparently a very closely allied form.

I have been unable to identify with certainty the following South African forms from the specimens in the Museum :—

P. dilutus, Thorell (Atti Soc. ital., v. 19, p. 103, 1887). Described as a variety of *villosus* and differing from it in the yellow colouration and finer granulation. The exact locality of the type, which was preserved in the Museum at Stockholm, is unknown.

P. segnis, Thorell (loc. cit., p. 110). Described as a doubtful variety of *brevimanus* and doubtfully referred by later authors to *capensis* (H. and E.), but the identity of the two forms is very improbable, as the type of *segnis* in the Gothenburg Museum was obtained by C. J. Andersson, who collected in Damaraland and Ovampoland.

P. mosambicensis, Peters (Monatsb. Berlin. Ak., 1861, p. 516). It is highly improbable that this species, which was found by Peters at Tette on the Zambesi, can be identical with *capensis* (H. and E.).

P. raudus, Simon (Ann. Soc. Ent. Fr. (6), v. 7, p. 377, 1887). Found by Dr. H. Schinz in German South-West Africa, and closely allied to

schlechteri Purc., but the upper surface of the tail (and presumably of the first segment also) is said to be deeply grooved longitudinally.

P. flavidus, Pocock (Ann. Mag. N. H. (7) v. 3, p. 419, 1899). From Tangs (Taungs?), Bechuanaland, and apparently closely related to *raudus* and *schlechteri*.

P. obscurus and *pachysoba*, Penther (Ann. Naturh. Hofmus. Wien., v. 15, pp. 154 and 155, 1900). These two forms do not apparently differ from *transvaalicus* Purc., as far as can be ascertained from Penther's descriptions, except in having a relatively shorter and stouter tail.

GEN. LYCHAS* C. L. Koch.

LYCHAS PEGLERI, n. sp.

♂ ♀. *Colour*.—Trunk blackish-brown to dark olive-green, variegated with yellow markings, the under surface, except posteriorly, pale; the first 6 abdominal tergites either almost entirely darkened or with the following principal yellow markings:—A median stripe, a longitudinal stripe near each lateral margin, an anterior transverse stripe joining these, a pair of >< marks, a pair of anterior oval spots (one on each side of the median line), a pair of short, transverse, lunate lines just behind the oval spots, besides a few other tiny dots scattered about; cephalothorax with the yellow markings very similar to those in *L. burdoi* (Sim.), the principal being a large spot behind each group of lateral eyes, a pair of curved lines closely embracing the dark olive-green median tubercle as in brackets, alongside these a pair of more lateral longitudinal lines converging posteriorly, 3 pairs of short obliquely transverse lines following in succession behind the median tubercle, the anteriormost running from the hind ends of the bracket-shaped marks outwards and forwards, the middle pair parallel to the anterior, but the posterior pair more transverse or even directed slightly backwards; on each side are also 2 large oblique stripes, and near the posterior margin is a broad two-horned area; near each lateral margin and often along the middle line is a narrow longitudinal stripe and at each anterior outer corner is a small V. Tail with an equal extent of yellow and infusate markings or the latter predominating; segment 5 very slightly darker posteriorly than the other segments; vesicle infusate, with yellow dots and stripes. Femur and tibia of pedipalps for the most part infusate above, with yellow markings; the hand yellow, with infusate longitudinal stripes and some veins,

* According to Pocock (P.Z.S., 1899, p. 834), this name should be substituted for *Archisometrus* Krpln.

the fingers deeply infusate or black proximally, paler distally. Chelicerae with a net-work of black. Legs infusate, striped longitudinally with yellow.

Cephalothorax thickly granular.

Tergites thickly granular, the yellow markings mostly smooth, except the median ones; the segments with 3 distinct keels, the lateral keels granular, short, occupying about $\frac{1}{3}$ or $\frac{1}{4}$ of the length of the segment.

Sternites.—Segments 1–3 of abdomen smooth and polished, segment 3 in ♂ weakly granular at anterior corners, segment 4 smooth in middle, weakly granular laterally in ♀, more extensively granular laterally in ♂, segment 5 weakly granular throughout, with 4 feebly granular keels.

Tail.—Segments 1–2 with 10, segment 3 with 8–10 and segment 4 with 8 well defined granular keels, the middle lateral keel strong in segments 1 and 2, distinct or rudimentary in segment 3 and absent in segment 4, the superior keels with the terminal denticle only slightly enlarged; segment 5 with distinct superior, infero-lateral, and median crests. The caudal surfaces minutely granular between the keels, especially in segment 5; the upper surface in segments 1–4 with a cuneate, granular, median area bordered by 2 rows of larger granules, which converge posteriorly. Vesicle about $\frac{3}{4}$ as wide and $\frac{2}{3}$ – $\frac{3}{4}$ as high as segment 5, weakly granular below and on the sides, the aculeus short, the tubercle below it small, cylindrical, blunt.

Pedipalps.—Femur granular above. Tibia granular anteriorly, smooth posteriorly, with a couple of irregular rows of granules on upper side. Hand stout, somewhat wider than the tibia in the ♀ and considerably wider in the ♂, rounded, not angular, finely granular anteriorly and at the base of the finger, weakly granular or nearly smooth on upper surface, smooth posteriorly; fingers short, about $1\frac{1}{3}$ times the length of the hand-back in the ♀, still shorter, about $1\frac{1}{5}$ times this length in the ♂; movable finger with 6–7 main rows and 7 anterior flanking granules, the enlarged proximal tooth in each main row flanked externally by 2 similar teeth.

Chelicerae with only one inferior tooth on the immovable finger.

Legs granular externally on femur and tibia, the tarsal spur between the first and second joints on the third leg small, about $\frac{1}{6}$ of the length of the second tarsal segment.

Pectines with 11–12 teeth in both sexes, the basal tooth in the ♀ very much enlarged, both longer and much wider than the others, normal in the ♂.

Measurements of a ♀.—Total length $30\frac{1}{2}$, length of tail 17, length of cephalothorax 3, length and width of fourth caudal segment 2·9, 1·6.

Locality.—Several ♂ and ♀ specimens from near Umtata, Cape Colony, collected by Miss Pegler and kindly sent to us by the Rev. Dr. F. Kolbe.

These are the first specimens of the genus recorded from South Africa. They differ apparently from all the other species of the genus in having two, instead of only one, external flanking teeth alongside of the enlarged basal tooth of each of the main rows on the fingers.

GEN. UROPLECTES Ptrs.

UROPLECTES CARINATUS (Poc.).*

1890. *Lepreus c.*, Pocock, P. Zool. Soc. London, Mar., 1900, pp. 129–130, pl. 14, figs. 3, 3a.

1896. *Uroplectes c.*, Pocock, Ann. Mag. N. H. (6), v. 17, p. 380.

Distribution.—The area inhabited by this species, as the list of

* This and the three following species form a group of closely allied forms with the following common characters:—Abdominal tergites 3-keeled, fingers of pedipalps with 9 main rows of teeth, the enlarged basal tooth in the rows flanked on each side by a single large tooth, the inner flanking tooth always situated at the end of the next proximal row, vesicle with no tooth below aculeus, all the inferior caudal keels well developed in segments 1–4, hand rounded, not angular or flattened. The adults of these 4 species may be distinguished as follows:—

a. With a pair of minute stylets situated one on each side of the genital opening behind just under the posterior inner angles of the halves of the operculum when the latter is closed. *Males*.

a¹. Fourth caudal segment $1\frac{5}{6}$ –2 times as long as wide . . *U. carinatus* (Poc.)

b¹. Fourth caudal segment $2\frac{1}{3}$ times as long as wide *U. alstoni*, n. sp.

c¹. Fourth caudal segment $2\frac{3}{4}$ to nearly $2\frac{3}{4}$ times as long as wide
U. karrooicus, n. sp.

b. Genital opening without stylets. *Females*.

a². Fourth caudal segment $1\frac{1}{2}$ – $1\frac{3}{4}$ times as long as wide; hand distinctly wider than tibia *U. carinatus* (Poc.)

b². Fourth caudal segment $1\frac{5}{7}$ –2 times as long as wide; hand distinctly wider than tibia *U. alstoni*, n. sp.

c². Fourth caudal segment from slightly more than twice to $2\frac{1}{2}$ times as long as wide; hand slightly narrower than tibia *U. karrooicus*, n. sp.

d². Fourth caudal segment $2\frac{1}{2}$ times as long as wide; hand as wide as or very slightly wider than tibia *U. schlechteri*, n. sp.

localities given further on shows, comprises the western half of Cape Colony with the exception of the strip along the south coast, which is occupied principally by *U. lineatus*. It extends from the Divs. of Malmesbury, Tulbagh, Worcester and Prince Albert in the south to Bushmanland in the north, and it is more than probable that a form with such a distribution would extend some distance north of the Orange River as well. The locality of the type-specimen is given as "South Africa, near the tropic of Capricorn."

The South African Museum possesses 84 specimens of this species, of which the principal characters may be enumerated here, as Pocock's original description, although very detailed, was founded upon a single ♂ example.

♂ ♀. *Colour*.—Trunk and tail pale yellow to ochre-yellow, the trunk sometimes olivaceo-ochraceous; the legs pale yellow, generally blackened along upper and under edges; tail with at least the 5th segment (except quite posteriorly) and the inferior keels and generally also the other keels more or less infuscated; trunk with only the three groups of eyes blackened, or much more extensively infuscated, especially along the anterior edge and the middle line of cephalothorax and along 3-5 longitudinal stripes on abdomen; hand often striped with infusate marks; vesicle pale yellow, with the aculeus dark reddish-brown distally.

Cephalothorax finely to somewhat coarsely granular throughout, sometimes with an oblique smooth area on each side between the median eye-tubercle and the lateral eyes in the ♀; often with a pair of distinct posterior keels composed of 2-4 granules, corresponding in position to the lateral keels on the tergites; eye-tubercle mostly entirely smooth along the groove but the crests often crenular before and behind (rarely also above), especially in the ♂.

Tergites 1-6 coarsely granular posteriorly in both sexes, but anteriorly each segment is very densely and minutely granular in the ♂ but smooth or almost so (rarely finely granular mesially) in the ♀; median and lateral crests very distinct, the latter short, represented by several granules in the posterior but by only 1 or 2 in the anterior segments and often absent in segment 1 or segments 1 and 2.

Sternites 1-4 smooth; segment 5 smooth, or granular laterally, provided with 4 more or less distinct, smooth or crenular keels.

Tail stout, 4th segment in the ad. ♂ $1\frac{5}{8}$ -2, in the ad. ♀ $1\frac{1}{2}$ - $1\frac{3}{4}$ times as long as wide; * the crests mostly denticulate but the 4

* All the measurements in this genus are taken in the same manner as those of *Parabuthus* as explained in foot-note on p. 145.

inferior ones often partially or wholly smooth in segment 1 and in the anterior part of segment 2 in both sexes; the terminal tooth of the superior crests in segments 1-3 and often also in segment 4, and of the superior lateral crests in segments 1-2 and sometimes also in segment 3, enlarged, stout and conical in the ♀, slenderer and often subspiniiform in the ♂; the middle lateral crest strong and well developed in segments 1-3, complete in segment 1, slightly abbreviated anteriorly in segment 2, still more so in segment 3, in which it varies considerably in length, occupying from $\frac{1}{4}$ to over $\frac{3}{4}$ of the length of the segment, while in segment 4 it may be completely absent or more or less distinct and weak, represented by a row of larger granules, in a series of specimens from one and the same locality. Anterior caudal segments finely granular above but smooth below; the sides of segments 1-4 and the under surface of segments 3-4 generally finely granular (rarely almost smooth) in the ♀, but often quite smooth in the ♂ between the keels; upper surface of segment 5 in the ♀ entirely smooth or granular laterally, rarely also minutely granular mesially, in the ad. ♂ finely and densely granular throughout, except along the median line in the anterior half; the superior keels in segment 5 developed only in the anterior $\frac{1}{6}$ - $\frac{1}{2}$ of the segment, the lateral surfaces densely and often coarsely granular or the inferior part smooth or nearly so, the inferior surface with coarse and fine granulation or the fine granulation absent, the coarse granules generally forming irregular accessory crests in the anterior half, the median crest generally distinct, rarely obsolete. Vesicle granular throughout, or smooth below and granular only on the sides and posteriorly below the aculeus, moderate or large in the ♀, smaller, rarely large, in the ♂.

Pedipalps.—Upper surface of tibia generally smooth (sometimes granular in the ♂), the anterior edge of this surface generally well defined and provided with a row or strip of granules; the anterior surface of tibia granular above. Hand smooth, except distally below, where it is frequently finely granular; its greatest width exceeding that of the tibia, especially in the ♂, the length of the tibia $2-2\frac{1}{2}$ times the width of the hand in ad. ♂; movable finger in the ♂ short, provided at the base with a distinct or indistinct lobe, the immovable finger sinuate at the base; fingers with 9 main rows of teeth.

Pectines with 19-26 (according to Pocock up to 27) teeth, the basal tooth in the ♀ always similar to the rest of the teeth in all our specimens, the scape longer in the ♂ than in the ♀ but varying in length according to locality.

Size.—The length varies from 27–41mm. in the ad. ♂ and reaches 44mm. in the ♀.

Localities in Cape Colony.—In the following list the local variations in colour, thickness of tail, &c., are generally mentioned.

A. *Abdomen with at most 3 dorsal stripes; fifth caudal segment infuscated laterally only in the anterior $\frac{2}{3}$ (rarely $\frac{3}{4}$) of its length; cephalothorax without median longitudinal stripe.*

Beaufort West Div.—(a) 2 ♂ from round the village of Beaufort West (*W. F. Purcell*); cephalothorax infuscated along anterior border; abdomen with a fine black median line and a row of infusate marks on each side above (a pair in the posterior part of each tergite); hand and tibia of pedipalp and the legs with infusate stripes; fourth caudal segment $1\frac{7}{8}$ times as long as wide; vesicle almost smooth below, excepting behind below the aculeus. Total length of a ♂ $28\frac{1}{2}$; length of cephalothorax 3, of tail $17\frac{1}{4}$; length and width of first caudal segment 2.1, 1.7, of second 2.4, 1.6, of third 2.6, 1.6, of fourth 3, 1.6, of fifth 3.5, 1.6, of sixth 3, 1.3; length of tibia of pedipalp 3.2, of hand-back 1.8, of movable finger 3.2; width of tibia 1.1, of hand 1.4.

Fraserburg Div.—(b) 1 ♂ (dry) from the village of Fraserburg (*E. G. Alston*); fourth caudal segment twice as long as wide; otherwise resembling the specimens from Beaufort West.

Prince Albert Div.—(c) 1 ♂ and several juv. from near the village of Prince Albert (*W. F. Purcell*); anterior margin of cephalothorax and also the keels and coarser granules of the tergites blackened in the adult, but the lateral rows of infusate marks on the tergites and the stripes on the hands absent or obsolete; fourth caudal segment twice as long as wide; vesicle as in (a).

Worcester Div.—(d) 1 ♀ and several juv. from Triangle (*R. M. Lightfoot*); colour as described under (c); fourth caudal segment $1\frac{3}{4}$ times as long as wide.

Namaqualand Div.—(e) 1 ♂ from near Naroep (between Naroep and Naap), Great Bushmanland (*Max Schlechter*); colour almost entirely pale yellow, only the 3 groups of eyes blackened and the inferior keels of tail and part of the fifth segment infuscated; crests of eye-tubercle entirely granular; fourth caudal segment and vesicle as in (c).

(f) 1 ♀ and juv. from Concordia (*J. H. C. Krapohl*); colour as described under (a).

Clanwilliam Div.—(g) 2 ♂ and a number of ♀ and juv. from Pakhuis (*R. and M. Schlechter, L. Mally*); colour as described under (a),

except that the legs and pedipalps are generally without infusate marks; tail stouter than usual, the fourth segment in the ♂ $1\frac{5}{8}$, in the ♀ $1\frac{1}{2}$ – $1\frac{3}{4}$ times as long as wide, the fifth segment more coarsely granular than usual, particularly on the sides and upper surface in the ♂; hands thicker than usual, the width in the ♂ equalling half the length of the tibia, the lobe on the movable finger strongly developed; vesicle distinctly granular below in both sexes. Measurements of a ♂ and ♀: Total length ♂ 30.5, ♀ 40; length of cephalothorax ♂ 3.2, ♀ 4.6, of tail ♂ 19, ♀ 25; length and width of first caudal segment ♂ 2.4, 1.8, ♀ 3, 2.9, of second ♂ 2.6, 1.8, ♀ 3.5, 2.8, of third ♂ 2.8, 1.8, ♀ 3.6, 2.7, of fourth ♂ 3.3, 1.8, ♀ 4.3, 2.7, of fifth ♂ 3.8, 1.8, ♀ 4.9, 2.7, of sixth ♂ 3.2, 1.4, ♀ 4.5, 2.5; length of tibia of pedipalp ♂ 3.2, ♀ 4.2, of hand-back ♂ 2.1, ♀ 2.5, of movable finger ♂ 3.2, ♀ 4.5; width of tibia ♂ 1.2, ♀ 1.6, of hand ♂ 1.6, ♀ 2.

(h) 1 ♀ and 1 juv. from Betjesfontein (*Miss M. Bergh*); resembling those from Pakhuis.

(i) 1 ♂ from the village of Clanwilliam (*R. M. Lightfoot* and *C. L. Leipoldt*); resembling those from Pakhuis but more blackened, especially on the legs and pedipalps.

B. Much more strongly blackened; the abdomen with 5 dorsal longitudinal stripes, viz., a median stripe (continued over cephalothorax to the anterior margin), a stripe on each side along lateral margin and another stripe on each side at a little distance from lateral margin; fifth caudal segment more extensively blackened, generally with only $\frac{1}{3}$ – $\frac{1}{4}$, rarely as much as $\frac{1}{2}$, of the length on the sides yellow posteriorly; legs generally blackened along the edges; vesicle always distinctly granular below.

Clanwilliam Div.—(j) 4 ♂ and a number of ♀ and juv. from Sneeuwkop in the Cedar Mountains (5,000–6,000 feet, *R. Pattison*); pedipalps not infuscated; tail and hands slenderer than in the specimens from Pakhuis; fourth caudal segment twice as long as wide in ♂ and $1\frac{2}{3}$ times in ♀; length of tibia $2\frac{1}{4}$ – $2\frac{1}{3}$ times the width of hand in ♂.

(k) 2 ♂ from Kakadouw Pass, Cedar Mountains (1,000–3,000 feet, *R. Pattison*, *C. L. Leipoldt*); pedipalps not infuscated; fourth caudal segment $1\frac{5}{8}$ – $1\frac{7}{8}$ times as long as wide; length of tibia $2\frac{1}{5}$ – $2\frac{1}{6}$ times the width of hand.

(l) 1 ♀ from Boschkloof, Cedar Mountains (*R. Pattison*); pedipalps not infuscated; fourth caudal segment $1\frac{2}{3}$ times as long as wide.

(m) Several ♀ and juv. from Boontjes River, near Pakhuis

(*R.* and *M. Schlechter*, *L. Mally*); pedipalps somewhat infuscated; fourth caudal segment $1\frac{3}{4}$ times as long as wide.

(*n*) 1 ♀ and 1 juv. from Onder Berg Vlei in the valley of the Berg Vlei River, north of the Piquetberg Range (*C. L. Leipoldt*); pedipalps, tergites, tail and legs ferruginous-yellow and mostly with ferruginous markings in addition to the infuscate markings.

Malmesbury Div.—(*o*) A very young specimen from near the village (*R. M. Lightfoot*), apparently belonging to this species.

Piquetberg Div.—(*p*) 1 ♀ and 1 juv. from Gutverwacht Mission Station; pedipalps with infuscate stripes; fourth caudal segment $1\frac{1}{2}$ times as long as wide.

Tulbagh Div.—(*q*) 1 ♀ and 1 juv. from Tulbagh Road Station (*W. F. Purcell*); fourth caudal segment $1\frac{1}{2}$ times as long as wide; large, length of ♀ 44 mm.

Worcester Div.—(*r*) 1 ♂, 1 ♀, and 1 juv. from near the village (*R. M. Lightfoot*, *W. F. Purcell*); pedipalps with black stripes; fourth caudal segment in ♂ twice, in ♀ $1\frac{2}{3}$ times as long as wide; large, length of ♂ 41 mm.

(*s*) 1 ♂, 4 ♀ and several juv. from Rabiesberg near Nuy River Station (*W. F. Purcell*); pedipalps with infuscate marks; fourth caudal segment $1\frac{3}{4}$ times as long as wide in ♀.

(*t*) 1 juv. from Touws River Station (*W. F. Purcell*); pedipalps with very distinct black stripes.

UROPLECTES ALSTONI, n. sp.

♂ ♀. *Colour* pale ochraceous; the legs paler yellow, with the upper and lower edges blackened; the 3 groups of eyes black; the cephalothorax along the anterior and lateral margins, the abdominal tergites on the keels, coarser granules and lateral margins, and the tail on the keels, finely blackened; the fifth caudal segment with its surfaces infuscated in the anterior $\frac{2}{3}$ only; pedipalps and chelicerae not infuscated.

Cephalothorax thickly granular, the posterior pair of crests distinct in the ♂, the superciliary ridges of the tubercle smooth above in the ♀ but granular throughout in the ♂.

Tergites and *sternites* as in *carinatus*, the last sternite smooth laterally.

Tail slenderer than in *carinatus*, the fourth segment in the ♂ $2\frac{1}{3}$, in the ♀ $1\frac{6}{7}$ – $1\frac{7}{8}$ times as long as wide; all the crests denticulate, the terminal tooth of the superior crests in segments 1–3 and of the upper lateral crests in segments 1–2 enlarged, slender and spiniform

in the ♂, stouter and conical in the ♀; the middle lateral crest as in *carinatus*, occupying in segment 3 about $\frac{2}{3}$ — $\frac{3}{4}$ of the length of the segment, almost absent in segment 4. Segments 1–4 minutely granular above and on the sides but almost smooth below in the ♂, mostly smooth in the ♀; segment 5 with the upper surface smooth along the middle but weakly granular towards the sides in the ♂, quite smooth in the ♀; the sides of this segment finely and thickly granular in the ♂, more sparsely granular in the ♀; under surface of segment 5 with distinct median and accessory crests and a number of scattered fine and coarse granules. Vesicle weakly granular below.

Pedipalps.—Femur finely granular above. Tibia finely granular above in ♂, smooth in ♀, the anterior edge of upper surface sharply marked and granular. Hand in ♂ considerably, in ♀ slightly wider than tibia, the length of the tibia in ♂ $2\frac{1}{2}$, in ♀ $2\frac{1}{3}$ times the width of the hand; movable finger distinctly lobed at base in ♂.

Legs finely granular externally on the femora and, in the ♂, on the tibiae also.

Pectines with 25–26 teeth in ♂ and 21–22 in ♀; the basal tooth in the ♀ resembling the rest.

Measurements.—Total length ♂ 35, ♀ 43; length of cephalothorax ♂ 3.3, ♀ 3.8, of tail ♂ 22, ♀ 23; length and width of first caudal segment ♂ 2.8, 2, ♀ 2.8, 2.4, of second ♂ 3.1, 1.8, ♀ 3.2, 2.2, of third ♂ 3.3, 1.7, ♀ 3.4, 2.2, of fourth ♂ 4, 1.7, ♀ 4.1, 2.2, of fifth ♂ 4.4, 1.7, ♀ 4.7, 2.2, of sixth ♂ 3.6, 1.5, ♀ 4.5, 2; length of tibia of pedipalp ♂ 3.6, ♀ 4.1, of hand-back ♂ 2.6, ♀ 2.4, of movable finger ♂ 3.4, ♀ 4.6; width of tibia ♂ 1.3, ♀ 1.6, of hand ♂ 1.7, ♀ 1.8.

Localities.—(a) 1 ♂ (type, reg. no. 477) and 1 ♀ from Touws River Station, Worcester Div. (*W. F. Purcell*). A 5-striped young individual, evidently belonging to *U. carinatus*, was found along with these specimens (see under (*t*) p. 180).

(b) 1 ♂ from Matjesfontein, Worcester Div. (*W. F. Purcell*); resembling the types, except that the fourth caudal segment below and the fifth segment above and below are much more thickly granular, and the enlarged terminal teeth of the superior crests of the anterior segments are stout and conical; posterior crests on the cephalothorax not distinct; number of pectinal teeth 24; pedipalps somewhat infuscated in places.

(c) 1 ♂ and 1 ♀ collected in Barkly Div., Cape Colony, along the west side of the Harts River between this river and the Kaap Plateau by Mr. Garwood Alston, in whose honour the species has

been named. With more black; tergites with broader median and marginal stripes and with a lateral infusate mark on each side in addition; cephalothorax with black marks also along the median line; hands with infusate stripes; chelicerae slightly blackened; fifth caudal segment more extensively blackened than in types. Cephalothorax in both sexes with the pair of posterior keels blackened and as strong as or even stronger than the lateral keels on sixth tergite; the crests on the eye-tubercle smooth in the middle above. Cauda very slightly slenderer, the fourth segment in ♂ $2\frac{1}{3}$ times, in ♀ twice as long as wide; the granulation in ♂ as in the ♂ from Matjesfontein, in ♀ the sides of the tail and the under surface of fourth segment also granular; the spiniform terminal teeth of superior crests in ♂ long and slender. Tibia of pedipalps smooth above, its length in the ♂ about $1\frac{1}{4}$ times, in the ♀ twice the width of the hand. Pectines with 22-23 teeth, the basal tooth in the ♀ widened and slightly elongated, falciform. Total length ♂ 40, ♀ 53; length and width of fourth caudal segment ♂ 4.3, 1.8, ♀ 5.3, 2.6, of tibia of pedipalp ♂ 3.8, 1.3, ♀ 4.8, 1.8; width of hand ♂ 1.7, ♀ 2.4.

(d) 3 ♀ from Namies, Great Bushmanland, Kenhart Div. (*Max Schlechter*), apparently belonging here; slightly less blackened than in the types from Touws River, except on the hands, which have infusate stripes and reticulation; the fourth caudal segment about twice as long as wide; the middle lateral crest in segments 2-3 only slightly abbreviated anteriorly, distinctly developed in segment 4 throughout the greater part of its length; segments 1-4 almost smooth below and on the sides or segment 4 granular; tibia of pedipalps sometimes granular above, its length about $2\frac{1}{2}$ - $2\frac{3}{4}$ times the width of hand; hand finely granular in front, slightly wider than the tibia; pectines with 23-27 teeth, the basal tooth $1\frac{1}{4}$ - $1\frac{3}{4}$ times as wide as, and generally a little shorter than, the adjacent teeth. Length of largest specimen 44; length and width of fourth caudal segment 4.7, 2.3, of tibia of pedipalp 4.7, 1.6; width of hand 1.7.

UROPLECTES KARROOICUS, n. sp.

♂ ♀. *Colour* pale yellow or pale ochre-yellow; cephalothorax blackened along anterior margin, on eye-tubercle and on some of the coarser granules; tergites blackened on the keels and on the lateral margins, and often with an infusate mark on each side; tail with the crests finely blackened, the fifth segment infuscated to near hind margin; legs blackened along upper and lower edges;

chelicerae finely reticulated with black; pedipalps only very slightly infuscated, the hands not distinctly striped with black.

Cephalothorax finely granular, with few coarse granules and without distinct crests; ocular tubercle smooth in ♀ but granular before and behind in the ♂.

Tergites and *sternites* as in *carinatus*.

Tail rather long and slender, especially in the ♂; the fourth segment in the ♂ $2\frac{2}{3}$ times, in the ♀ very slightly more than twice as long as wide; crests as in *carinatus*, the anterior infero-median ones denticulate to nearly smooth in the ♂, mostly smooth in the ♀; the enlarged terminal teeth of superior crests conical; the middle lateral crest developed in the posterior $\frac{1}{3}$ — $\frac{2}{3}$ in segment 3, absent in segment 4; intercarinal spaces in segments 1–4 mostly smooth, or the sides sparsely granular; segment 5 smooth above in ♀, thickly granular in ♂; the sides and under surface of segment 5 rather thickly granular, the under surface with coarse granules which form accessory crests in the anterior part; vesicle distinctly granular below.

Pedipalps slender. *Tibia* finely granular above in ♂, almost smooth in ♀, the anterior edge of upper surface sharply marked and granular; length of tibia in ♂ $2\frac{1}{2}$, in ♀ 3 – $3\frac{1}{2}$ times the width of the hand. Hand slender, minutely granular anteriorly in the ♂, nearly smooth in the ♀; its width slightly exceeding that of tibia in ♂ and slightly less than this width in ♀; the movable finger in ♂ long, twice as long as hand-back, the lobe at base very weak.

Legs granular exteriorly.

Pectines with 23–25 teeth, the basal tooth in the ♀ either normal or slightly wider and longer than the rest, falciform.

Measurements of largest ♂ and ♀.—Total length ♂ 40, ♀ 42; length of cephalothorax ♂ 3·8, ♀ 3·8, of tail ♂ 26, ♀ 23; length and width of first caudal segment ♂ 3·2, 2·1, ♀ 2·8, 2·3, of second ♂ 3·8, 1·8, ♀ 3·2, 2·1, of third ♂ 4·2, 1·8, ♀ 3·4, 2, of fourth ♂ 4·8, 1·8, ♀ 4·1, 2, of fifth ♂ 5·2, 1·8, ♀ 4·6, 2, of sixth ♂ 4, 1·6, ♀ 4·1, 1·7, of tibia of pedipalps ♂ 4·2, 1·4, ♀ 4·3, 1·5; width of hand ♂ 1·5, ♀ 1·4; length of hand-back ♂ 2·4, ♀ 2·2; of movable finger ♂ 4·6, ♀ 5.

Localities in Cape Colony.—(a) 2 ad. ♂ (types, reg. no. 475), 3 ad. ♀ and a number of juv. from round the village of Beaufort West (W. F. Purcell). I also collected two ♂ of *U. carinatus* in the same locality, but these were easily distinguishable by their colour (see under (a), p. 178).

(b) 1 ad. ♂ and 1 ♀ from Laingsburg, Prince Albert Div. (W. F.

Purcell) ; colour and structure as in the types, except that the fifth caudal segment is smooth above in the ♂ ; length of fourth segment in ♂ nearly $2\frac{3}{4}$, in ♀ $2\frac{1}{5}$ times as long as wide. Length ♂ 38, ♀ 38·5 ; length and width of fourth caudal segment ♂ 4·8, 1·7, ♀ 4·4, 2.

(c) Three young specimens from round the village of Prince Albert (*W. F. Purcell*). I also found several specimens of *U. carinatus* inhabiting the same locality (see under (c), p. 178).

There is very little difference between the females of *alstoni* and *karrooicus*, although the males are easily separable.

UROPLECTES SCHLECHTERI, n. sp.

♀. *Colour* pale yellow, the abdomen sometimes olivaceous-ochraceous ; the three groups of eyes black ; the anterior, lateral and often also the posterior margins of the cephalothorax and of most of the tergites very finely blackened, but the tergal keels of first 6 segments not blackened ; the inferior keels of posterior caudal segments and the anterior $\frac{2}{3}$ of fifth segment infuscated ; the legs blackened along lower edges ; chelicerae with fine infusate reticulation.

Cephalothorax finely granular, the posterior pair of crests distinct or indistinct, the eye-tubercle smooth.

Tergites and *sternites* as in *carinatus*.

Tail long, the fourth segment $2\frac{1}{2}$ times as long as wide ; the crests in segments 1-4 for the most part feebly denticulate, the infero-medial, and for the most part also the infero-lateral keels smooth in segment 1 ; middle lateral crest strongly abbreviated in segments 2-3, being present only in the posterior $\frac{1}{2}$ or $\frac{1}{3}$ in segment 2 and in the posterior $\frac{1}{4}$ or $\frac{1}{5}$ in segment 3, wholly absent in segment 4 ; upper surface of tail somewhat granular in anterior, smooth in posterior segments ; the intercarinal surfaces on the sides and below almost entirely smooth in segments 1-4, except between the superior and upper lateral crests in segment 1 ; segment 5 almost smooth, or with a few weak granules on the sides, the under surface with the usual 3 finely denticulate keels, the surfaces between these keels with an irregular series of coarser remote granules along the middle on each side ; vesicle weakly and sparsely granular below.

Legs sparsely granular or nearly smooth externally.

Pedipalps.—Femur smooth above. Tibia smooth above, its upper surface with the anterior border sharply marked and granular, its length $2\frac{2}{3}$ -3 times the width of the hand. Hand slightly exceeding or almost equalling tibia in width.

Pectines with 23–24 teeth, the basal tooth broad but very short, triangular.

Measurements of type.—Total length 46; length of cephalothorax 4·6, of tail 27·5; length and width of first caudal segment 3·4, 2·5, of second 4, 2·1, of third, 4·4, 2·1, of fourth 5, 2, of fifth 5·3, 2, of sixth 4·5, 2, of tibia of pedipalp 4·8, 1·7; width of hand 1·8; length of hand-back 2·7, of movable finger 5·2.

Localities in Cape Colony.—(a) Type: 1 ♀ (reg. no. 2,976) from Naroep, Great Bushmanland, Namaqualand Div. (*Max Schlechter*). *U. carinatus* also occurs near this place (see under (e), p. 178).

(b) 1 ♀ from Namies, Gt. Bushmanland, Kenhart Div. (*Max Schlechter*). Another species, which I believe to be identical with *U. alstoni*, n. sp., occurs in this locality also (see under (d), p. 182).

(c) 1 ♀ from Nous, Gt. Bushmanland, in the northern part of Kenhart Div. (*Max Schlechter*).

UROPLECTES TRIANGULIFER (Thor.).

1877. *Tityus t.*, Thorell, Atti Soc. ital., v. 19, p. 123, ♂ ♀.

1890. *Uroplectes t.*, Pocock, P.Z.S., 1890, pl. 13, figs. 5–5b.

1896. *U. t.*, Pocock, Ann. Mag. N.H. (6), v. 17, p. 384; also, 1898, *ibid.* (7), v. 1, p. 310 (locality).

1899. *U. t.*, Kraepelin, Das Tierr., Scorp. & Pedip., p. 59.

1900. *U. t.*, Penther, Ann. Naturh. Hofm. Wien, v. 15, p. 157 (locality).

Localities.*—

a. *U. triangulifer (typicus)*. Tergites of abdomen fuscous, black or greenish-black, with three rather wide, longitudinal, yellow stripes (a median and two marginal) and a large >-shaped yellow mark on each side of the median stripe; cephalothorax with much yellow; caudal segments with infusate stripes below and generally also on the sides, the fifth segment generally more or less infusate; the femora of legs, when partially infuscated, with the infusate marks present in the distal part of the outer surface at least. (Pedipalps with the tibia, except at base, and the hands, except on the fingers, more or less infusate or black, the hands provided with stripes and reticulation.) The specimens in the collection with this typical colouration fall into two groups:—

* *U. triangulifer* has been recorded by Pocock from Pretoria and Pietersburg (Transvaal), Basutoland, and Port Elizabeth, and by Penther from the Albany Div. (C. Col.).

A. With the basal pectinal tooth not enlarged in the ♀, the fourth caudal segment in the ♂ not more than $2\frac{1}{4}$ times as long as wide.

(a) Kroonstad. 2 ♂ and 2 ♀ (*W. Watermeyer*): Sides of the fifth caudal segment in ♀ coarsely granular in lower but very weakly granular in upper part, the superior margins smooth or almost so, except on the short anterior crest; the sides in the ♂ much pitted and with only a few very weak granules or nearly smooth; upper surface of femur of pedipalp also infusate; cephalothorax with the prevailing colour black, but with numerous yellow markings. Length of largest ♂ and ♀ 51, 47; length and width of fourth caudal segment in ♂ 6.2, 2.8, in ♀ 4.7, 3. In Thorell's types, which agree very closely with these specimens, the superior margins of the fourth caudal segment were also smooth, and the basal pectinal tooth of ♀ is not mentioned as being enlarged; the type-specimens measured ♂ 47, ♀ 42, length and width of fourth caudal segment in ♂ 5.5, 2.5, in ♀ 4.5, 3.

(b) Kimberley. 2 ♀ (*G. A. Quenet*): Tail resembling that of the specimens from Kroonstad, but the sides of the fifth segment almost smooth, with some granulation in the lower part, while the body and limbs are much less infusate. Length 47, length and width of fourth caudal segment 5.1, 3.2.

(c) Brakkloof, near Grahamstown. 2 ♂, 5 ♀, and a number of juv. (collected by Mrs. G. White and presented by Dr. Schönland, of the Albany Museum): Sides of the fifth caudal segment as well as the upper margins densely and coarsely granular throughout in the ♀; the sides of this segment in the ♂ more sparsely granular and the superior edges almost smooth, except anteriorly. Prevailing colour of cephalothorax yellow, the principal infusate mark being a large V enclosing the yellow interocular area. Length of largest ♂ and ♀ 50, 43, length and width of fourth caudal segment in ♂ 5.8, 2.6, in ♀ 4.5, 2.9.

(d) Grahamstown, Albany Div. 2 ♂ and 1 juv. (*Rev. J. A. O'Neil*): Resembling the specimens from Brakkloof, but the superior margin of 5th caudal segment sparsely granular in ♂ and the cephalothorax more black than yellow, on the interocular area only the anterior part being yellow. Length of largest ♂ 48, length and width of fourth caudal segment 5.6, 2.6.

(e) Port Elizabeth. 2 ♀ (*J. L. Drège*): Colour of cephalothorax and granulation of tail as in the specimens from Brakkloof. Length 43, length and width of fourth caudal segment 4.1, 2.8.

(f) Dunbrody, on the Sundays River, Uitenhage Div. 1 ♂, 2 ♀, and several juv. (*Rev. J. A. O'Neil*): Colour of cephalothorax and

granulation of tail as in the examples from Brakkloof. Length of ♂ and ♀ 42·5, 45, length and width of fourth caudal segment in ♂ 5·2, 2·4, in ♀ 4·5, 2·7.

(g) Kingwilliamstown. 1 ♀ (*F. A. Pym*): Colour of cephalothorax and granulation of tail as in the examples from Brakkloof.

B. *With the basal pectinal tooth enlarged in the ♀, the tail relatively slightly longer and narrower in the ♀ and especially in the ♂, the fourth segment as much as $2\frac{1}{2}$ times as long as wide in the larger males.*

(h) Johannesburg. A large number of ♂, ♀, and juv. (*J. P. Cregoe, H. A. Fry*): With the tibia of pedipalp (except at base) and the hands strongly infuscated, but the femur yellow; the cephalothorax with much black, the interocular area almost quite black with only a small, anterior, median, yellow spot. Granulation of tail as in the examples from Brakkloof, etc., the superior margins of fourth caudal segment in ♂ nearly smooth, except anteriorly, or sparsely granular. Length of a large ♂ and ♀ 52, 45½, length and width of fourth caudal segment in ♂ 6·1, 2·4, in ♀ 4·7, 2·8. In small males the tail is relatively shorter, as in group A, but these are probably immature specimens, although otherwise resembling the largest ones.

β. *U. triangulifer* var. *tristis*, Thorell, Atti Soc. ital., v. 19, p. 123, 1877. Trunk black or olivaceous-black, without yellow markings or with a yellow stripe along the median line of the tergites only; tail fuscous brown to black, with or without a pair of yellow lines below; pedipalps black or brown, the distal part of the femur and often also the base of tibia and the fingers yellow; the femora of legs black or brown proximally but yellow distally. Eastern part of Transvaal.

(a) Barberton. 2 ♂, 4 ♀, and 2 juv. (*J. P. Cregoe*): Black or olivaceous-black, the median yellow line on tergites absent or confined to the posterior half of the segment; cauda with yellow lines below; pedipalps with distal two-thirds of femur, the base of the tibia, and the fingers yellow; femora of legs yellow distally for more than half their length, the tibiae broadly yellow at both base and apex; fifth caudal segment granular on sides in ♀ but almost smooth (with some weak granulation in lower part) in ♂, the superior crests more or less granular in ♀ but quite smooth, except on the anterior crest, in ♂; basal pectinal tooth more or less enlarged in ♀. Length of largest ♂ and ♀ 41, 41, length and width of fourth caudal segment in ♂ 4·8, 2·3, in ♀ 3·7, 2·4.

(b) Lydenburg, Transvaal. 1 ♂ and ♀ (*Dr. J. W. B. Gunning, of the Pretoria Museum*): Yellow median line on tergites broader and continuous throughout whole segment; tail dark brown, the under

side with two yellow stripes anteriorly but fuscous posteriorly; pedipalps dark brown, the femur at apex (and the fingers in ♀) yellow; femora of legs yellow distally for less than half their length, tibiae dark brown, yellow only quite at the base; the sides and superior margins of fifth caudal segment thickly granular in ♀, more sparsely and finely granular in ♂, the basal pectinal tooth much enlarged in ♀. Length of ♂ and ♀ 47, 47, length and width of fourth caudal segment in ♂ 5·3, 2·6, in ♀ 4·5, 2·9.

UROPLECTES LINEATUS (C. L. Koch).

1845. *Tityus l.*, C. L. Koch, Die Arachn., v. 11, p. 7, fig. 854.

1891. *T. l.*, Kraepelin, Jhb. Hamb. wiss. Anstalten, v. 8, p. 89.

1896. *Uroplectes l.*, Pocock, Ann. Mag. N.H. (6), v. 17, p. 382.

1899. *U. l.*, Kraepelin, Das Tierreich, Scorp. & Pedip., p. 60.

1900. *U. l.*, Penther, Ann. Naturh. Hofm. Wien, v. 15, p. 157 (localities).

This very common species occurs only in the southern portion of Cape Colony, where it inhabits an area extending from Cape Town along the south coast eastwards at least as far as Mossel Bay and northwards into the Divs. of Tulbagh and Worcester. Outside this area *lineatus** is not known to occur, being replaced to the north by *carinatus* and its allies, and to the east by *triangulifer* and *formosus*.

The species is subject, as usual, to a certain amount of local variation, chiefly as regards the proportions of the caudal segments, the size of the enlarged terminal tooth of the superior caudal crests, and the colouration. The boundary between the lateral and inferior surfaces in the fifth caudal segment is generally marked by a more or less distinct edge or by a row of granules, but sometimes it is almost obliterated. The enlarged terminal tooth of the superior crests in segments 2 and 3 in the ♂ is larger than in the ♀, and is rather slender, at least in the apical part, in one or both segments. The tubercle below the aculeus is normally strong and toothlike, laterally compressed and generally more or less pointed, occasionally, however, low and blunt. In young individuals this tubercle is relatively longer and slenderer than in the adult. The basal pectinal tooth is never elongated in the ♂, and in the ♀ it is only moderately enlarged and does not project beyond the apices of the adjacent teeth. The vesicle is yellow, often with several narrow, lightly (rarely darkly) infusate stripes.

* Penther states that the species occurs at Mossel Bay and at Grahamstown.

The following is a list of the localities from which the Museum has obtained specimens :—

Cape Div. (a) Cape Peninsula. *U. lineatus* is very common under stones, etc., on the hills and mountain sides throughout the Peninsula, but on the sandy Flats it is much more rarely met with. It is often found also in gardens, and sometimes even in houses, in Cape Town itself. The abdomen has five longitudinal yellow stripes or rows of yellow marks, viz., one median, one on each lateral margin, and one between these on each side. The three middle yellow stripes are generally divided into an anterior and posterior part by a patch of black in each of the posterior or in all the tergites, or the inner lateral stripes * are represented in the posterior segments by a pair of $> <$ marks. The median keel is also generally infuscated. Cephalothorax strongly blackened, with a number of yellow stripes and marks. Vesicle ochre-yellow, with or without faint infuscate marks. Enlarged terminal tooth of superior caudal crests in segments 2 and 3 in the ♂ conical and very strong at base, slenderer towards the apex, where it is sharply pointed and curved in one or both segments. In the ♀ the terminal tooth is smaller, conical and mostly pointed but generally not curved at the apex. The boundary line between the lateral and inferior surfaces in segment 5 is more or less distinct and marked, at least posteriorly, by a row of granules. The pectinal teeth vary from 17–20 in the ♀ and from 18–21 in the ♂. Large; length of largest ♂ 45, ♀ 45; length and width of fourth caudal segment in ♂ 5, 2·6, in ♀ 4, 2·7. In the largest males this segment is less than twice (generally about $1\frac{2}{10}$) as long as wide, but in smaller (immature?) males it is stouter, often only $1\frac{3}{4}$ times as long as wide.

Paarl Div. (b) French Hoek: 4 ♀ and juv. (*W. F. Purcell*), resembling those from the Cape Peninsula.

Stellenbosch Div. (c) Jonkershoek: 1 ♂, 3 ♀, and 3 juv. (*W. F. Purcell*), resembling the specimens from the Cape Peninsula.

Tulbagh Div. (d) North end of the Roode Zands Mountains: 1 ♀ (*W. F. Purcell*), resembling the specimens from the Cape Peninsula.

Worcester Div. (e) Slanghoek: 2 ♂, 19 ♀, and 4 juv. (*R. Francke*, *W. F. Purcell*), resembling the specimens from the Cape Peninsula, but the fourth caudal segment about $2\frac{1}{10}$ as long as wide in ♂. Length of largest ♂ 38, length and width of fourth caudal segment 4·4, 2·1.

* In specimens from the Cape Town slope of Signal Hill these lateral stripes (but not the median stripe) are frequently continuous throughout the segments, and not at all or scarcely interrupted by black bars.

(f) Village of Worcester, at the railway station: 1 ♂, 1 ♀ (C. L. Leipoldt), resembling the specimens from the Cape Peninsula.

(g) Touws River Station: 1 dried ♀ (W. F. Purcell).

Ceres Div. (h) Ceres Village: 12 ♀ and several juv. (R. M. Lightfoot, W. F. Purcell). In these specimens the three middle yellow stripes on the abdomen are continuous, *i.e.*, not interrupted by transverse bars of black in the middle of each tergite, the median keel also generally not blackened; otherwise as in the specimens from the Cape Peninsula.

Caledon Div. (i) Hottentots Holland Mountains, on the summit near Sir Lowry's Pass: 9 ♂, 7 ♀, 4 juv. (W. F. Purcell), closely resembling the specimens from the Cape Peninsula but slightly smaller in size; length of largest ♂ $37\frac{1}{2}$, length and width of fourth caudal segment 4.1, 2; fourth caudal segment in the 6 largest ♂ specimens ($32-37\frac{1}{2}$ mm. long) twice, in the 3 smaller (immature?) ♂ specimens ($29\frac{1}{2}-31\frac{3}{4}$ mm. long) $1\frac{3}{4}-1\frac{7}{8}$ times as long as wide.

(j) Venster Ravine at the village of Caledon: 5 ♀, 1 juv. (W. F. Purcell), resembling the specimens from the Cape Peninsula.

Swellendam Div. (k) The Pass at Avontuur near Stormsvlei, on the River Zonder Einde: 1 juv. (W. F. Purcell).

(l) Swellendam Village: 1 ♀ (H. A. Fry); the three middle yellow stripes on abdomen continuous; the vesicle ochre-yellow, with five dark infusate stripes on the sides and below, darkly infusate also on the superior lateral margins anteriorly. Closely resembling Koch's figure of *U. striatus* (C. L. Koch) in colouration.

Bredasdorp Div. (m) Marcus Bay: 2 ♂ (H. A. Fry). The three middle yellow stripes on abdomen broad and continuous, the cephalothorax with much black. The edge between the lateral and inferior surfaces of fifth caudal segment almost obliterated; the terminal tooth of the superior crests in segments 2-3 strong and sharp but scarcely curved; the fourth caudal segment $2-2\frac{1}{9}$ times as long as wide. Length of largest ♂ 33, length and width of fourth caudal segment 3.8, 1.8; length of the other ♂ 32, length and width of fourth segment 3.6, 1.8.

Robertson Div. (n) Ashton, on the mountain side at entrance to Kogmans Kloof: 1 ♂, 1 ♀, 1 juv. (Mrs. W. F. Purcell and W. F. Purcell). The three middle yellow stripes on abdomen broad and continuous, not interrupted by cross bars of black; the cephalothorax yellow, blackened only along the median line and at the edges; the terminal tooth of superior caudal crests not much enlarged in segments 2 and 3, small and rather slender in both sexes; sides of fifth segment distinctly bordered below by a row of granules; fourth

caudal segment in ♂ about $2\frac{1}{2}$ times as long as wide; length of ♂ 41, length and width of fourth caudal segment in ♂ 4·3, 2.

Mossel Bay Div. (o) 2 ♀ from near the town (W. F. Purcell). The three middle yellow stripes on abdomen broad and continuous, but the cephalothorax with much black; the superior terminal teeth in segments 2-3 of tail conical, strong; proportions of tail much as in the specimens from the Cape Peninsula; infero-lateral edges of the fourth caudal segment more or less distinct.

UROPLECTES INSIGNIS Poc.

1890. *U. insignis*, Pocock, P.Z.S., 1890, p. 132, pl. 13, fig. 4, ♀.

1896. *U. lineatus* subsp. *insignis*, Pocock, Ann. Mag. N.H. (6), v. 17, p. 382.

1899. *U. lineatus* var. *insignis*, Kraepelin, Das Tierr., Scorp. and Pedip., p. 60.

The Museum possesses 6 ♂, 3 ♀, and 4 juv. from the Cape Peninsula.

U. insignis was originally described by Pocock as a distinct species but was subsequently regarded by him as a melanistic subspecies of *lineatus*. *U. insignis* is not, however, more blackened than the darkest specimens of *lineatus* from the Cape Peninsula, except on the vesicle and inferior surface of the cauda, and it differs in colour from such specimens principally in the following points: (1) The yellow ><-shaped marks are as distinct on the anterior as on the posterior abdominal tergites, whereas in *lineatus* these marks are always more or less resolved into a pair of irregular yellow blotches in the anteriormost tergites at least; (2) the anterior caudal segments are provided with a pair of longitudinal black stripes below divided by a fine median yellow line (in *lineatus* the under side of the anterior segments is yellow with a fine median black line, which generally extends over the last abdominal sternite as well); (3) the vesicle is deeply blackened on the sides and below, and provided below with two narrow, and on each side with a broader, lateral, yellow, longitudinal stripe, the upper surface more lightly infusate in the middle part (in *lineatus* the vesicle is always ochraceous, with a narrow inferior median line and the anterior lateral angles darker or lightly infusate, the sides also often with faintly infusate stripes, two such stripes when distinctly marked corresponding on each side to the single broad infero-lateral black area of *insignis*).

In *insignis* the tubercle below the aculeus, although always distinct, is, as already noticed by Pocock, smaller and weaker than in

lineatus, being merely conical and blunted in the adult and not sharply toothlike or distinctly laterally compressed, as is the case with *lineatus* from the Cape Peninsula. In young individuals, however, the tubercle is relatively longer and slenderer than in the adult. The enlarged terminal superior tooth in second and third caudal segments is thick and blunt at the apex in the ♂, and not slender and curved at the apex as in the ♂ of *lineatus*. In the ♀ of *insignis* this tooth is also thick and very blunt at the apex, although slightly smaller than in the ♂, whereas in the ♀ of *lineatus* from the Cape Peninsula it is slenderer apically than in *insignis* and much more pointed in at least one of the segments.

The basal tooth of the pectines in the ♀ is much more enlarged than in *lineatus* and, moreover, projects slightly but distinctly beyond the line of the rest. In the ♂ the pectinal teeth are broader, and with the exception of the basal one, more imbricating than in *lineatus*, so that the basal tooth when viewed from below appears distinctly broader than the exposed part of the adjacent teeth. This is not the case in *lineatus*. In the ♂ of *insignis* this basal tooth is further actually enlarged and distinctly exceeds the adjacent tooth in width and length. The number of the teeth varies in the ♀ from 16–18 (15–17 in Pocock's specimens) and in the ♂ from 17–20.

U. insignis is much rarer than *lineatus*, and has hitherto been found only at certain places in the Cape Peninsula. Most of our specimens were obtained on the Newlands and Constantia slopes of Table Mountain by Mr. W. L. Sclater, while a single example was found by Mr. R. M. Lightfoot on the Kalk Bay Mountain. According to Pocock Dr. H. A. Spencer obtained *insignis* only on Table Mountain and *lineatus* only on the lower ground. As a matter of fact, however, *lineatus* is common on the mountain sides as well, and I have myself found both forms living side by side at the foot of the mountain at Newlands. I think, therefore, that *insignis* is something more than merely a melanistic mountain form of *lineatus*, and prefer to regard it as a distinct species for the present at any rate, although the structural differences between the two forms cannot be regarded as of any considerable specific importance.

The boundary between the lateral and inferior surfaces of the fifth caudal segment is generally just distinguishable as a weak edge with or without a row of granules.

UROPLECTES MARLOTHI, n. sp.

♀. *Colour*.—Trunk olive-greenish to brownish black, the abdomen with a broad, continuous and very conspicuous pale yellow

median band above; tergites 1-6 also, as in *insignis*, with the usual >< mark and with a narrow longitudinal stripe on each side near the lateral border inconspicuously yellow; cephalothorax much paler and more yellowish anteriorly, with a large posterior median mark, an oblique mark on each side of the median tubercle and various other marks inconspicuously yellow. Tail olive-greenish black on the sides and below, with some obscure brownish or yellowish markings, the upper surface obscurely brownish or brownish yellow, infusate along the middle; vesicle as in *insignis*. Under side of trunk pale yellowish, but the last abdominal sternite black. Legs pale yellow, with a few infusate markings. Pedipalps pale yellow, with large infusate patches, the hands striped and reticulated.

Cephalothorax rather sparsely and finely granular, almost smooth on the interocular area and around the median tubercle.

Tergites almost entirely smooth, or sparsely granular laterally in the posterior part of the segments; median keel smooth.

Sternites smooth, without trace of keels.

Cauda relatively longer than in *insignis* and *lineatus*, the fourth segment $1\frac{2}{3}$ times as long as wide; second, third, and fourth segments when seen from above almost parallel-sided, scarcely at all bulging convexly from before to behind; no well-developed granular crests; the superior edges weakly subcrenular, terminating behind in segments 2-3 in a low stout blunt tubercle; the two upper lateral keels also indicated in segment 1 and smooth or subcrenular; all other keels absent; sides and under surface of segments 1-3 smooth or nearly so, or the sides with a few granules; segment 4 rather weakly but thickly granular; segment 5 more coarsely and thickly granular, especially below, without trace of an edge or keel between the lateral and inferior surfaces; upper caudal surface granular mesially in segment 1, smooth in the other segments; vesicle thickly granular, the tubercle below the aculeus very low, convex or almost quite obsolete, never pointed or toothlike.

Pedipalps.—Femur finely granular above; upper surface of tibia smooth, with a strip of granules along its anterior edge; hand smooth, stouter than the tibia, the dentition much as in *lineatus*.

Legs.—Femora and generally also the posterior tibiae granular externally.

Pectines with 18-22 teeth, the basal one enlarged.

Locality.—6 ad. ♀ collected on the summit of the Great Winterhoek (altitude above 6,800 feet), Tulbagh Div., by Dr. R. Marloth, Messrs. Gother Mann and Bolus.

Measurements.—Total length 43; length of cephalothorax 4·7, of tail 24·5; length and width of first caudal segment 2·8, 2·9, of second segment 3·4, 2·7, of third segment 3·5, 2·6, of fourth segment 4·4, 2·6, of fifth segment 4·8, 2·6, of sixth segment 4·9, 2·3; length of tibia of pedipalp 4·5, 1·9; width of hand 2·2; length of hand-back 3·3, of movable finger 4·6.

Besides being relatively shorter, the second, third, and fourth caudal segments in the ♀ of *lineatus* and *insignis* appear more convex at the sides from before to behind when seen from above; in *marlothi* these sides are almost parallel. The granulation on the under surface of the fifth caudal segment in *marlothi* is about as coarse as, although much denser than, that in a ♀ *lineatus* from the Cape Peninsula.

U. marlothi is closely related to *U. insignis*, from which it may be distinguished by the total absence of the infero-lateral crest or edge in the fifth caudal segment.

GEN. OPISTHOPHTHALMUS C. L. Koch.

OPISTHOPHTHALMUS WAHLBERGI (Thor.)

Three local races of this species, differing in the colouration of the tail, may be distinguished:—

a. *O. wahlbergi* (*typicus*) with at most the fifth caudal segment blackened towards the apex, the rest of the tail being yellow.

This agrees with the description Thorell gives of his spirit specimen from the Stockholm Museum, which is said to have been found by Wahlberg in “Caffraria” and may be taken as the type. The South African Museum possesses three specimens from German South-West Africa (*Dr. R. Marloth*), in one of which (a young ♀) the fifth caudal segment is lightly infuscated on the sides and below in the posterior half, while in the other two specimens (described in Ann. S. A. Mus., v. 1, p. 140) none of the caudal segments are blackened. This form is not known to occur south of the Orange River, and Wahlberg’s specimen doubtless also came from German South-West Africa, probably from Damaraland, whence the species has been recorded by Kraepelin and Pocock.*

β. *O. wahlbergi* var. *garipeensis*, n., with the fourth caudal segment more or less blackened on the sides and below, the fifth

* *O. wahlbergi* has also been recorded from British Bechuanaland by Penther (Ann. Naturh. Hofm. Wien, v. 15, p. 158, 1900), but no mention is made of the colouration.

segment being blackened all round except at the posterior end, which is pale yellow like the vesicle; chelicerae and fingers of pedipalps not darkened.

This form was discovered by Mr. M. Schlechter and described by me as the "Yellow-stinged race" of *wahlbergi* in Ann. S. A. Mus., v. 1, p. 139. It is only known from the narrow strip of country lying between Vuurdoord and Naroep* in the north of Little Bushmanland, Namaq. Div., immediately south of the Orange (Gariep) River. The Museum has many specimens from Naroep (which may be taken as the types of the variety) and a few from Vuurdoord and Hunitsamas, both near Ramonds Drift, and from Zandhoogte between Hunitsamas and Naroep, all of which have been already mentioned in my previous paper.

γ. *O. wahlbergi* var. *nigrovesicalis*, n., with the vesicle, the whole of the fifth caudal segment, a great part of the fourth and often a few patches at the end of the third, blackened or dark olive-green, as are also the fingers of the chelicerae.

This form is identical in colouration with the dried specimen from the Gothenburg Museum mentioned by Thorell, and a very large number of specimens (over 650) has recently been collected by Mr. M. Schlechter and described by me as the "Black-stinged race" of *wahlbergi* in Ann. S. A. Mus., v. 1, p. 139. It appears to occur, generally in abundance, throughout Little and Great Bushmanland (in the N.E. part of Namaq. Div. and the N. part of Kenhart Div. in Cape Colony),† and throughout the whole of this area the same type of colouration is preserved.

To the numerous localities given in my former paper (p. 140) may be added (a) Beeststert (near Coboop at the Orange River), and (b) Zwartmodder, both in Kenhart Div. (*M. Schlechter*).

The specimens from Naroep may be regarded as the types of this variety, and it is noticeable that at this locality both the varieties occur side by side without showing any transitional forms of colouration. It is evident that they do not interbreed.

OPISTHOPHTHALMUS LONGICAUDA Purc.

This species appears to be common in the north of Kenhart Div. in Great Bushmanland, where Mr. M. Schlechter collected the following specimens:—

* *I.e.*, between long. 18° 15' and 18° 40' E. of Greenwich.

† This area of distribution extends from about long. 18° (Jackalswater) to about long. 19½° (Zwartmodder), a distance of over 100 miles.

(a) 28 ♀ (15 ad.) and 19 ♂ (2 ad.) from Zwartmodder: Number of pectinal teeth in ♀ 15–18, in ♂ 19–23; length of cephalothorax in ♀ $16\frac{1}{4}$ –19 mm., in ♂ $16\frac{1}{4}$ – $17\frac{1}{2}$ mm. These specimens are of a much larger size than the types from Naroep, as they measure up to 135 mm. (♀) and 130 mm. (♂) in length. In the ad. ♂ the tail is $4\frac{2}{3}$ times as long as the cephalothorax, which is equal to, or slightly less than the femur of the pedipalp in length; moreover, the upper surface of the hand is less smooth than in the types, being more or less granular near the denticulate inner margin. In the ad. ♀ the tail is more than $3\frac{3}{4}$ and often nearly four times as long as the cephalothorax.

(b) 2 ad. ♀, 3 ad. ♂ and a number of juv. from Beeststert near Coboop in the north-west corner of Kenhart Div: Large specimens, nearly equalling *gigas* in size and measuring up to 147 mm. (♀) and 132 mm. (♂) in length.

(c) 2 juv. from Beenbreek on the Orange River.

OPISTHOPHTHALMUS KARROOENSIS Purc.

*Additional localities.**—(a) 1 ad. ♂ and several juv. from Kogmans Kloof near Ashton and (b) 1 ad. ♀ and several juv. from Hot Baths near Montagu, Robertson Div. (W. F. Purcell and Mrs. W. F. Purcell): Resembling those from Ashton, but larger; length of cephalothorax in ad. ♀ 17 mm.

(c) 9 ♀ (5 ad.) and a number of ♂ (5 ad.) from Jansenville (in the collection of the Albany Museum, and kindly lent by Dr. Schönland): Number of pectinal teeth in ♀ 16–20, in ♂ 21–29; length of cephalothorax in ad. ♀ $11\frac{1}{4}$ –13 mm., in ad. ♂ 11– $12\frac{1}{2}$ mm. In the ad. ♀ the fifth abdominal sternite is very weakly granular posteriorly or almost entirely smooth, the length of the hand-back generally very distinctly exceeds the width of the hand, and the first caudal segment is generally almost smooth below in the anterior part and sometimes only very weakly granular in the middle posteriorly. In the ad. ♂ the first abdominal sternite and often also the second (except laterally) are frequently smooth.

OPISTHOPHTHALMUS AUSTERUS Karsch.

Additional localities.—(a) 1 ad. ♀ from Middelburg, Cape Colony (Dr. C. S. Piers).

* Penther (Ann. Naturh. Hofm. Wien, v. 15, p. 159, 1900) has recently recorded this species from the Outeniqua Mountains (George and Knysna Divs.).

(b) 1 ad. ♂, 2 ad. ♀ and a number of juv. from Colesberg (*C. L. Leipoldt*). There can no longer be any doubt that *O. colesbergensis* Simon (Soc. ent. Fr. ser., 5, v. 10, p. 388, 1880) from the same locality is identical with *austerus* Karsch, as suggested by Kraepelin. The species is evidently nearly related to *karrooensis* Purc.

OPISTHOPHTHALMUS CARINATUS (Pet.).

*Additional localities.**—(a) 1 juv. ♂ from Beenbreek on the Orange River in north-west of Kenhart Div., Great Bushmanland (*M. Schlechter*): Number of pectinal teeth 32.

(b) 1 juv. ♀ from Kakamas on the Orange River in north of Kenhart Div. (*M. Schlechter*): Number of pectinal teeth 16–17.

(c) 1 ad. ♂ from the neighbourhood of Upington on the Orange River in south of Gordonia, Bechuanaland: Number of pectinal teeth 30; length of cephalothorax $16\frac{1}{2}$ mm.; colour as in the ♀ from Great Bushmanland previously described; under surface of abdominal and anterior caudal segments almost smooth, only faintly transversely striated in places; length of hand-back exceeding width of hand.

(d) 9 ♀ (3 ad.) and 7 ♂ (2 ad.) collected along the western side of the Harts River (between that river and the Kaap Plateau) in the Barkly Div., Cape Colony (*Garwood Alston*): Number of pectinal teeth in ♀ 16–20, in ♂ 24–28; length of cephalothorax in ad. ♀ 13–14·3 mm., in ad. ♂ 13·3 mm.; hind margin of abdominal tergites generally broadly ochraceous; anterior surface of tibiae and of distal part of femora of legs generally more or less strongly infuscated; under surface of abdominal and of anterior caudal segments as in the ♂ from Upington (see *c* above); length of hand-back in ad. ♂ equal to the width of hand; width of hand in largest ♀ 10·8, in ♂ 9·2, length of hand-back in ♀ 9·6, in ♂ 9·2, length of movable finger in ♀ 14·5, in ♂ 14·7. These specimens are smaller in size, lighter in colour, and have much narrower hands than the specimens from Bushmanland and Upington.

OPISTHOPHTHALMUS ATER Purc.

A ♀ of this very rare scorpion was recently found by Dr. R. H. Howard on a hillock about nine miles from Port Nolloth, Namaq. Div. It differs from the ♂ in the following points:—

* Penther (Ann. Naturh. Hofm. Wien, v. 15, p. 158) has recently recorded the species from the Cango Valley near Oudtshoorn. This locality is very far south of any place from which we have specimens.

♀. *Colour* of the whole animal very dark blackish-brown, the pectines pale yellowish.

Cephalothorax as long as the first and second caudal segments and $\frac{2}{3}$ of the third, its anterior edge emarginate in the middle.

Tergites 2-6 smooth in the middle, but finely granular towards the sides, the median keel smooth in all the segments.

Sternites all smooth; the spiracles narrow, with parallel edges.

Tail.—Upper surface finely and sparsely granular in the anterior, but smooth in the posterior segments, the terminal tooth of the superior crests enlarged in segments 1-4; sides of the tail smooth or with a few fine granules between the keels; ventral surface of segments 1-2 smooth, polished and minutely punctate, that of segment 3 more uneven, especially laterally, but not granular, that of segment 4 weakly and thickly granular; the infero-lateral keels smooth and almost obsolete in segment 1, smooth and very weak in segment 2, weak but granular posteriorly in segment 3, quite distinct and weakly granular in segment 4; vesicle smooth on the basal half below.

Pedipalps.—Upper crest of tibia coarsely granular, the posterior surface less granular than in ♂; hands less hairy, broad, moderately convex, and thickly covered above with low tubercles, which are more isolated but anastomose somewhat near the inner basal angle; inner edge of hand with blunt granules; width of hand considerably exceeding length of hand-back; the granules of the finger-keel partially fused in the distal part to a short smooth keel, which does not exceed, however, $\frac{1}{4}$ or $\frac{1}{5}$ of the whole length.

Legs.—Terminal tarsal segment of third leg with one, of fourth leg with no external spines below, the outer terminal lobe with four spines in both pairs of legs; the penultimate tarsal segment of third and fourth legs with an external spine below, proximal to the large intersegmental spur (this being also the case in the ♂).

Pectines with 11 teeth, the scape free of teeth at the base for $\frac{2}{5}$ of its length.

Measurements.—Total length 80; greatest length of cephalothorax $11\frac{1}{2}$; width $10\frac{1}{4}$; distance of eyes from anterior median edge $7\frac{3}{4}$; width of hand $8\frac{3}{4}$; length of hand-back $6\frac{1}{2}$, of movable finger $9\frac{1}{2}$, of tail 37.

OPISTHOPHTHALMUS GRANICAUDA Purc.

Additional locality.—1 ad. ♂ from Klipfontein (near Steinkopf), Namaq. Div., Cape Colony (Dr. R. H. Howard): Interocular area of

cephalothorax densely and coarsely granular almost throughout, smooth only on a small area at the summit of each lateral convexity.

OPISTHOPHTHALMUS GRANIFRONS Poc.

Additional specimens of the principal form.—1 ad. ♀ and 4 ad. ♂ from Concordia (*J. H. C. Krapohl*): Number of pectinal teeth in ♀ 12, in ♂ 15–16 (rarely 17); length of cephalothorax in ♀ 14 mm., in ♂ $11\frac{1}{4}$ – $15\frac{1}{2}$ mm.; tarsus of third leg always with an external inferior spine*; granulation of last abdominal sternite in ♂ as in the specimens from Steinkopf. These specimens agree very closely with those from Steinkopf.

OPISTHOPHTHALMUS PICTUS Krpln.

The Museum possesses specimens from the following localities:—

(a) 1 ad. ♀ from Port Elizabeth (*J. P. Cregoe*).

(b) 9 ad. ♀ from Red House Station (about 9–10 miles from Port Elizabeth), Uitenhage Div. (*J. L. Drège*): Number of pectinal teeth 11–14; length of cephalothorax 11– $12\frac{1}{2}$ mm.

(c) 12 ♀ (9 ad.) and 3 ♂ (2 ad.) from Dunbrody on the Sundays River, Uitenhage Div. (*Rev. J. A. O'Neil*): Number of pectinal teeth in ♀ 10–14, in ♂ 14–16; length of cephalothorax in ad. ♀ $11\frac{3}{4}$ –15 mm., in ad. ♂ $12\frac{1}{2}$ – $12\frac{3}{4}$ mm.

The colour in all these specimens is much as described by Kraepelin, but the fingers are blackish green and the sides of the cephalothorax are often more or less deeply tinged with olive-greenish. The ♀ has been described in detail by Kraepelin (*Jahrb. Hamb. Anst.* v. 11, p. 102, 1894) but not the ♂, the principal characters of which are the following:—

♂. *Cephalothorax* equalling or very slightly exceeding the first and second caudal segments in length (equalling the first and second and half of the third in the ♀); surface of interocular area smooth or very weakly granular (as is also the case in the ♀).

Tergites 1–6 finely shagreened, the posterior ones more coarsely granular laterally behind (in the ♀ these segments are smooth, or more or less granular laterally).

Sternites of abdomen thickly covered with large coarse tubercles (smooth only along the anterior border of segment 1 and on the lung-books of the anterior segments), which are strongly transverse

* Pocock (*Ann. Mag. N.H.*, ser. 6, v. 17, p. 242) records a young specimen from Concordia, in which this spine was absent.

in the mesial portion of the segment in the last 3 or 4 segments, particularly in segment 5, in the mesial part of which are some 10–15 extremely strong ridges. (In the ♀ these tubercles are very weak in the anterior segments and sometimes quite absent in segment 1, while in segment 5 the mesial transverse ridges are lower, although very distinct.)

Tail.—Medial and lateral inferior keels replaced in segment 1 by transverse ridges and rounded tubercles respectively, resembling those of the fifth abdominal sternite in size and appearance; these keels in segments 2–3 distinct, coarsely granular. (In the ♀ segment 1 resembles the fifth abdominal sternite below, while in segments 2 and 3 the inferior keels are weakly or coarsely granular.)

Pectines with the scape somewhat elongated at the base and free of teeth for about a quarter of its length (in the ♀ for about one-third of its length).

Hands lightly convex above, much narrower, the granules on the upper surface smaller, sharper, and more conical and isolated than in the ♀; width of hand exceeding the length of hand-back; the inner edge denticulate; length of hand $19\frac{1}{2}$, width 9, length of hand-back $7\frac{2}{3}$, length of movable finger $12\frac{1}{2}$.

In both sexes of this species the finger-keel of the hands is smooth or nearly so for the greater part of its length, or more or less broken up into coarse granules proximally, the granular portion occupying at most half of the whole length. The secondary keels of the hand are denoted principally by 2 black stripes. The superior crest of the tibia of the pedipalp is granular and the posterior surface is provided with the usual series of ridges (sometimes almost obsolete) and generally also with a few coarse granules, at least distally, along the middle. Terminal tarsus of the fourth leg usually with 3 (but often with 4) spines on the outer lobe (4 is the number given by Kraepelin).

OPISTHOPHTHALMUS CRASSIMANUS Pure.

Additional specimens of *variety* β :—

(a) 2 ad. ♀ from Bladgrond, Great Bushmanland, Kenhart Div. (*M. Schlechter*).

(b) 1 juv. from Beenbreek and (c) 1 juv. from Kakamas, both near the Orange River in the north of Kenhart Div. (*M. Schlechter*).

Variety γ .—A third variety of *crassimanus* occurs in Carnarvon Div., Cape Colony, which is distinguished by the presence on the penultimate tarsal segment of the third and fourth legs (at least on one side of the body) of an external inferior spine, situated a little

proximal to the large intersegmental spur. This spine was absent from all our specimens of the typical form and of *variety* β . 2-lamelliform hairs are always present on the inner surface of the basal segment of the chelicerae. This variety is represented by the following specimens:—

(d) 9 ad. ♀, 2 ad. ♂, and 22 juv. from Van Wyks Vlei (*D. C. Alston*): Length of cephalothorax in largest ♀ $16\frac{1}{2}$ mm., in ♂ $14-15\frac{1}{2}$ mm.; tarsus of fourth leg normally with three but not infrequently four spines on the outer terminal lobe; abdominal sternites in ♀ much more strongly granular than in the types, all the segments (rarely segment 1 quite smooth) granular in the middle and, in the posterior segments, also laterally (except on the lung-books), the mesial granules of the posterior segments coarse and strongly transverse,* especially in segment 5; untoothed basal portion of the scape of the pectines shorter than in the types or *variety* β , forming only $\frac{2}{3}$ of the whole length in the ♀; anterior fork on cephalothorax generally quite absent or indistinct, sometimes quite distinct.

OPISTHOPHTHALMUS NITIDICEPS Poc.

The Museum contains the following specimens:—

(a) 1 juv. from Port Elizabeth (*J. L. Drège*).

(b) 21 ♀ (11 ad.) and 12 juv. ♂ from Dunbrody on the Sundays River, Uitenhage Div. (*Rev. J. A. O'Neil*): Number of pectinal teeth in ♀ 12–16, in ♂ 13–20; length of cephalothorax in ad. ♀ $11\frac{1}{2}$ –13 mm.

The ♀ of *nitidiceps* closely resembles that of *crassimanus* in having the hands very convex above and very broad (their breadth almost equalling the length of the cephalothorax), the vesicle granular anteriorly below for a considerable extent, the scape of the pectines free of teeth at the base for some distance ($\frac{1}{3}$ of its length) and the cephalothorax very smooth, being finely granular only at the sides. It differs principally in having the infero-median keels of first and second caudal segments distinct, weakly crenular, replaced by low granules only in the anterior part of segment 1, which is weakly granular below, the last abdominal sternite mostly weakly granular, the finger-keel of pedipalps smooth or nearly so for a more or less considerable portion of its length (but generally more or less granular, or at least crenular, proximally), and the terminal tarsus of the third

* Similar granules often occur in the ♀ of *variety* β from Great Bushmeland, e.g., in some of the specimens from Hummel.

and fourth legs with two (very rarely three) external spines below in addition to the four (very rarely three) spines on the terminal outer lobe. The ad. ♂ is unfortunately not known, but in the juv. ♂ the last abdominal sternite is coarsely granular, and most of the other sternites are weakly granular in the middle, while the scape of the pectines is rounded at the base behind and free of teeth for a short distance (about $\frac{1}{4}$ of its length, more or less).

The superior process of the tarsi is shorter than the terminal lobes, and the terminal tooth of the superior caudal crests is sharply conical and sometimes enlarged, sometimes not.

OPISTHOPHTHALMUS CHAPERI Sim.

Additional locality.—1 ad. ♂, 4 ad. ♀ and several juv. from Brandvlei, Worcester Div. (*I. Meiring, W. F. Purcell*). This locality somewhat extends the known range of the species.

OPISTHOPHTHALMUS FOSSOR Purc.

Additional localities.*—(a) 1 ad. ♂ from the Boschjesveld Range, overlooking Villiersdorp, Caledon Div. (*Gother Mann*).

(b) 1 ad. ♂ from the western end of the mountain at Caledon (*G. French*).

OPISTHOPHTHALMUS MACER Thor.

Additional localities.†—(a) 1 ad. ♂ from Hex River Valley (collected by Mr. F. Treleaven to the north of Hex River East Station): Number of pectinal teeth 21–22; colour of legs ochraceous, the tibiae infuscated at both ends and along the upper edge; cephalothorax granular throughout.

(b) 5 ♀ (3 ad.) from the Venster Ravine at Caledon (*E. Watermeyer, W. F. Purcell*): Number of pectinal teeth 11–12; interocular area granular throughout or smooth behind; legs dark reddish brown.

(c) 1 ♀ from Houwhoek, Caledon Div. (*Mrs. W. F. Purcell*): Legs dark reddish brown.

(d) 8 ♀ (7 ad.) and 3 ♂ (2 ad.) from River Zonder Einde, Caledon Div. (*W. F. Purcell*): Number of pectinal teeth in ♀ 11–13, in ♂ 14–16; interocular area granular throughout (rarely somewhat smooth behind in the ♀); legs reddish brown.

* Penther (Ann. Naturh. Hofm. Wien, v. 15, p. 158) has recently recorded the species from the Outeniqua Mountains (George and Knysna Divs.) and Robinsons Pass (between Oudtshoorn and Mosselbay Divs.).

† Penther records this species from British Bechuanaland, which is very north of any locality from which *macer* had previously been recorded.

(e) 1 ad. ♀ from Elim, Bredasdorp Div. (*E. Lemmerz*): As above.

(f) 2 ♂ and 1 ♀ from the mountain-side at Swellendam (*H. A. Fry, W. F. Purcell*): Number of pectinal teeth in ♂ 17–18; legs reddish brown; interocular area granular (♂) or smooth behind (♀).

(g) 1 ad. ♂ from Witteklip near Van Stadens River, Uitenhage Div. (*J. L. Drège*): Interocular area nearly smooth behind.

OPISTHOPHTHALMUS LATIMANUS C. L. Koch.

*Additional localities.**—(a) 8 ad. ♀ from the vicinity of Kingwilliamstown (*J. Wood, H. M. Chute*): Number of pectinal teeth 11–14.

(b) An ad. ♀ and ♂ from Graaff Reinet (*G. French*).

(c) 3 ad. ♀ and 1 ad. ♂ from Blue Cliff, Uitenhage Div. (*J. L. Drège*): Number of pectinal teeth 12–14.

(d) 1 ♀ from Hell's Gate Kloof at Uitenhage (kindly lent by Mr. F. West, of Port Elizabeth).

All the above specimens resemble those previously described from Brakkloof, the legs being dark reddish brown.

(e) An ad. ♀ and ♂ from Jansenville (in the Albany Museum, kindly lent by Dr. Schönland): Number of pectinal teeth in ♀ 14–16, in ♂ 19; colour as in the specimens from Brakkloof, except that of the legs, which is *pale ochraceous*.

OPISTHOPHTHALMUS GLABRIFRONS Pet.

Additional localities.—(a) 2 ad. ♂ and several ♀, collected about twenty miles east of Pietersburg, Zoutpansberg District, Transvaal (*Rev. J. W. Daneel*): Large; closely resembling the specimens described under (a) in my previous paper (p. 161).

(b) 1 ad. and 1 juv. ♂, collected along the Harts River, Barkly Div., Cape Colony (*Garwood Alston*): Large; closely resembling those described under (a) in my previous paper (p. 161), except that the finger-keel is partially smooth distally.

(c) 1 ad. ♂ from the Matopo District, Matabeleland (*R. Pillans*): Size and characters of the ♂ from Bechuanaland, described under (c) in my previous paper (p. 162).

(d) 2 ad. ♂ and 2 ad. ♀ from Salisbury, Mashonaland (*G. A. K. Marshall*): Rather small specimens, the ♂ resembling those from Mazoe, but the ♀ with the finger-keel more granular and the interocular area nearly smooth.

(e) 6 ad. ♂ from Waterberg in the north of the Transvaal

* Penther records the species from the Outeniqua Mountains (George and Knysna Divs.), as well as from various places in Albany Div.

(*R. v. Jutrsenka*), kindly lent by Dr. Gunning, of the Pretoria Museum: Number of pectinal teeth 14–19; length of cephalothorax $12\frac{3}{4}$ –14 mm.; distance of eyes from anterior margin $2\frac{1}{10}$ – $2\frac{1}{3}$ times their distance from hind margin; finger-keel granular in the proximal half, smooth in the distal half or third, rarely granular almost throughout its length; secondary keel of hand granular, strong distally but very weak or obsolete proximally; interocular area almost entirely smooth, or the anterior and medial part more or less roughened with very minute granulation; tarsus of fourth leg often with only three spines on the outer terminal lobe; total length 85–99 mm. These specimens closely resemble those described under (*e*) in my previous paper (p. 162), but they are larger and the colour is not reddish, the tail, legs, and pedipalps being pale yellowish to yellowish brown. (S. A. Mus. reg. no. 5076.)

GEN. HADOGENES Krpln.

HADOGENES GRANULATUS, n. sp.

Adult ♂ (dry).—*Colour* reddish brown, the legs paler, the cephalothorax somewhat blackened laterally on each side of the interocular area; pedipalps with black crests and fingers; vesicle yellowish.

Cephalothorax broader than long, the frontal margin nearly straight, not emarginate in the middle; the upper surface very densely granular throughout, the granulation fine, except that on the sides of the cephalothorax and in the depressed area in front of the median tubercle, where it is much coarser than elsewhere and plainly visible to the unaided eye; lateral eyes small, equal, the middle eye distant about $\frac{1}{3}$ of its diameter from the anterior and almost its own diameter from the posterior eye; superciliary ridges of median eyes weakly crenular above, granular behind.

Tergites 1–6 very finely shagreened, except on the broad anterior raised borders, which are mostly nearly smooth; seventh segment as long as broad, narrowed behind but not semicircularly rounded, the upper surface finely shagreened, with coarser granulation towards the sides behind; the broad anterior raised border of the seventh segment very minutely granular, emarginate behind and provided with the usual pair of small pits at hind margin.

Sternites smooth and polished, the last segment with a pair of very large and deep apical depressions.

Tail very long, six times the length of the cephalothorax, which is equal to the first caudal segment together with slightly less than $\frac{1}{4}$ of

the second. Segment 1 depressed, wider than high, highest and widest near hind end, becoming narrower and considerably lower towards the front; the sides straight throughout the greater part of the segment but not parallel, diverging gradually from the anterior end backwards as far as the widest part near hind end, behind which the sides converge again for a very short distance; length of the segment $3\frac{1}{4}$ times the width and nearly $3\frac{2}{3}$ times the height behind; the superior keels far apart, forming a pair of low, broad, rounded, finely granular ridges but without any seriate granulation, and ending behind in a pair of low convexities; the upper surface broadly grooved medially throughout the whole length and finely granular. Surface of tail, especially on the sides, very finely granular, more coarsely so in the fifth segment. Superior keels sharply denticulate in segments 2-5, the denticles very small in the anterior part of segments 2-3, and strongest in the posterior segments, the terminal tooth slightly enlarged in segments 3-4 but not spiniform. Lateral keels strong in segment 1, nearly smooth, or weakly granular in places, abbreviated at posterior and anterior end, the sides of segments 2-5 raised convexly along the middle longitudinally but scarcely carinate. Inferior lateral and medial keels almost smooth in segment 1, very finely (but not serially) granular and irregularly roughened with pits in segments 2-3, coarsely denticulate in segment 5 (with about 12-15 large teeth in each keel).

Vesicle somewhat compressed, broader than the hind end of segment 5, the surface, especially below, very irregular, densely and rather coarsely granular (like the sides of fifth segment); upper side almost straight, being only very slightly convex in the middle, but slightly concave posteriorly before the base of aculeus.

Pectines with 22-23 teeth, the scape angular at the base behind.

Pedipalps with the fingers lobed at base; the hand slightly convex along the middle above, with the upper surface more or less reticularly granular, the granulation coarse towards the sides.

Locality.—An old specimen labelled "Rustenburg District, Transvaal" (reg. no. 420, *T. Ayres*).

Measurements.—Total length 191 (abdomen stretched, natural length probably about 185); length of cephalothorax $18\frac{3}{4}$, width $19\frac{1}{3}$; length of last abdominal tergite $12\frac{3}{4}$, width 13; length of tail 113; length of first segment 14, greatest width (behind) $4\frac{1}{3}$, height behind 4; length of second segment 21, of third segment $21\frac{1}{4}$, of fourth segment 24, of fifth segment 22, of sixth segment $11\frac{3}{4}$; width behind of fifth segment 3; width of vesicle $3\frac{1}{3}$, height $4\frac{1}{2}$; length of femur of pedipalp 18, width of upper surface (including bordering granules)

$6\frac{1}{2}$, length of anterior surface (measured along the middle from proximal side of large basal tooth to distal end of segment) $11\frac{1}{2}$, width of anterior surface (including bordering crests) $5\frac{1}{5}$; length of hand $32\frac{1}{2}$, width 10; length of hand-back 19, of movable finger 17.

This species appears to be near *H. tenuirus* (Thor.), which was described from a ♀ specimen obtained by C. J. Andersson, who collected in Damaraland.

ORDER PEDIPALPI.

PHRYNICHUS SCULLYI, n. sp.

Colour of the cephalothorax and pedipalps blackish brown to nearly black, the hands reddish; abdomen dark brown above, the lateral borders of the tergites, the sides and the ventral surface ochraceous; legs light brown to yellowish brown, the proximal part of the femora blackish brown. (The two small specimens altogether lighter, with brown cephalothorax and pedipalps, and brownish yellow abdomen and legs.)

Whole animal thickly granular.

Cephalothorax $1\frac{3}{4}$ times as wide as long (in the two small ex. about $1\frac{3}{5}$ times), the subspina in front of the oc. tubercle prominently projecting.

Pedipalps very stout; the anterior face of the femur and tibia broad and flat, granular, each bordered along both the upper and the lower edges by a row of sharply conical teeth and 5–7 longer spines, the 3 distal spines of the upper edge of the tibia subequal and very long; hand with a strong, curved, conical spine (in the young ex. a large conical tubercle) at the base above, as in *Damon*; length of the femur somewhat exceeding the width of the cephalothorax in the largest specimen (less than this width in the other examples).

Localities.—(a) Nieuwoudtville, Calvinia Div., Cape Colony. Typical ex. (reg. no. 6,307, *E. B. Watermeyer*); length of trunk $15\frac{1}{2}$, width of cephalothorax $9\frac{1}{2}$, length of femur of pedipalp $8\frac{1}{2}$.

(b) Pakhuisberg, Clanwilliam Div. (young ex., *R. Schlechter*).

(c) Namaqualand, Cape Colony (young ex., *W. C. Scully*).

(d) A large dried ex. without a history; length of trunk 19; length of femur of pedipalp $13\frac{1}{4}$, width in middle $2\frac{1}{4}$, height in middle $2\frac{3}{5}$; width of cephalothorax $12\frac{1}{4}$.

This genus has not previously been recorded from South Africa, where the first specimen was found by Mr. Scully.

ORDER SOLIFUGÆ.

The known South African genera may be determined from the following table:—

- a. Fourth leg with a pair of terminal claws Fam. SOLPUGIDÆ.
- a¹. First leg without claws.
- a². Second and third legs with 4, fourth leg with 7 tarsal segments.
- a³. Ocular tubercle with a number of bristles on anterior side; the metatarsus of the pedipalps without true spines, generally with a number of stout truncated cylinder-bristles below.. *Solpuga* Licht.
- b³. Ocular tubercle with only 2 large bristles in front, behind them 2 smaller ones, all forming part of the semicircular series round the medial side of each eye; metatarsus of pedipalps with true spines below in the ♂ *Zeriassa* Poc.
- b². Second and third legs with 1-2, fourth leg with 1-4 tarsal segments.
- a⁴. Second and third legs with 2, fourth leg with 4 distinct tarsal segments *Dassia* Karsch.
- b⁴. Second and third legs with unsegmented tarsus.
- a⁵. Tarsus of fourth leg distinctly 2-jointed, the distal segment shorter than the proximal one and movably articulated to it *Blossia* Sim.
- b⁵. Tarsus of fourth leg 1-2-jointed, but the distal joint not movably articulated.
- a⁶. Metatarsus and tibia of pedipalp without true spines below, the metatarsus thickly studded all round with brownish-black, truncated, cylindrical bristles .. *Hemiblossia* Krphn.
- b⁶. Metatarsus and tibia of pedipalp with distinct spines below *Gluviospis* Krphn.
- b¹. First leg with a pair of small terminal claws; tarsus of second to fourth legs 2-jointed *Ceroma* Karsch.
- b. Fourth leg without claws Fam. HENISOPODIDÆ.
- a⁷. Pedipalps without spines *Hexisopus* Karsch.
- b⁷. Pedipalps with strong spines *Chelypus*, n. g.

GEN. SOLPUGA Licht.*

* I have previously called attention to the fact that in some species of this genus, e.g., *S. cervina* Purc. (Ann. S. A. Mus., v. 1, p. 415) and *S. vineta* C. L. Koch (*ibid.*, p. 420), the flagellum occupies different positions in dried and in spirit specimens, the distal part of the shaft being bent much further backwards (or downwards) in the former than in the latter case. From an examination of some living males of *S. vineta* it appears that the natural position of the recurrent portion of the flagellum when at rest is a nearly horizontal one, parallel to the upper side of the chelicerae. On being placed in spirits the recurrent shaft immediately rises to an angle of about 45°, as drawn in fig. 23 (*loc. cit.*, p. 421).

I should also mention that the specimens doubtfully referred to on p. 401 of the paper quoted above as young of *Solpuga* have since proved to belong to the genera *Blossia* or *Hemiblossia*.

SOLPUGA LETHALIS C. L. Koch.*

Additional localities.—(a) Concordia, Namaqualand Div. (♂, J. H. C. Krapohl).

(b) Ashton, Robertson Div. (♂, E. de Wet); also Bonnie Vale Farm near Bushmans Drift on the Breede River (near Ashton), Swellendam Div. (♀, Ch. Groom).

SOLPUGA VENATOR Poc.

Additional locality.—Dunbrody, on the Sundays River, Uitenhage Div. (3 ♂, 5 ♀, and 7 juv., Rev. J. A. O'Neil; also 1 ♀, E. H. L. Schwarz and A. W. Rogers). Apex of flagellum reaching to between the anterior and posterior margins of the eye-tubercle; the ♀ and juv. occasionally with a very minute additional tooth just in front of the third or intermediate tooth of the upper finger of one of the chelicerae.

According to Kraepelin (Das Tierr., Palp. and Sol., p. 57), the ♀ of this species is distinguishable from that of *lethalis* by the possession of a number of short truncated cylinder-bristles on the ventral surface of the tibia of the pedipalp, similar to those on the metatarsus. Although this is the case in the ♀ of *venator* from Namaqualand, it is not so in the specimens from Dunbrody,† in which the truncated cylinder-bristles, although plentiful on the metatarsus, are very scarce or almost entirely absent from the under surface of the tibia in the ♀, all or almost all the short bristles on this surface being slender and notched at the apex. I know of no reliable character for distinguishing the ♀ of these two species. The best character so far appears to be the number of intermediate teeth in the single series of the upper finger of the chelicerae.

SOLPUGA CERVINA Purc.

8 ♂ of this species were recently obtained at Steinkopf, Namaqualand Div., by Mr. M. Schlechter. The anterior of the two intermediate teeth of the upper jaw may be quite absent (as was also the case in the ♀ previously recorded by me from this place, *loc. cit.*, p. 417), or present and minute, as in the type.

* The literature of the species of *Solpuga* is given in Kraepelin, Das Tierr., Palp. and Sol., 1901.

† As no ♂ of *lethalis* has as yet been found anywhere near this locality, these ♀ cannot well be considered as belonging to the latter species.

SOLPUGA ALSTONI, n. sp.

(Fig. 1.)

♂. *Colour* brown, the under surface of the trunk and of the bases of the legs pale yellowish; fingers of chelicerae pale yellow, reddish to black at the apex; cephalothorax along the middle and at the sides also pale yellowish; fourth leg with the apex of femur, the tibia, metatarsus, and tarsus brownish-black; malleoli infuscated at the edges; abdominal tergites brownish-black, the anterior ones broadly brown on each side, the bristles on the tergites brownish-black at base, white distally; sides of the abdomen with a narrow black stripe above but broadly dark brown below, thickly covered with soft white hairs; under surface pallid, with pallid hairs, the posteriormost segments dark brown with light brown hairs. Fourth leg with numerous, extremely long, soft, white hairs on the femur (on all sides) and on the sides and upper surface of the tibia and metatarsus; second and third legs with a small number of similar hairs on the femora and tibiae. Pedipalps long, the tibia and metatarsus with numerous truncated bristles below, the femur with 4-5 very strong spiniform bristles below, the proximal one being shortest and extremely stout.

FIG. 1.—*S. alstoni*, n. sp.

Chelicerae.—Upper finger straight, curved downwards but not outwards at the apex of the terminal fang, and provided below with 5 teeth in the single series, the two intermediate ones (third and fourth) very distinct; basal half of terminal fang with the upper medial edge not carinate but rounded for some distance in front of the flagellum, the middle of the fang with a short oblique keel commencing on the upper surface and ending anteriorly on the median side in a small angle. Lower finger with 2 strong curved teeth and a small intermediate one.

Flagellum.—Basal enlargement high and almost rotundate in outline when seen from the medial side, the superior edge sharp and strongly laterally compressed; procurent portion of shaft extremely short; the anterior bend extremely short and sudden, far back,

situated over the intermediate teeth, the recurrent portion of shaft, when seen from the side, ascending directly from the upper surface of the terminal fang almost straight upwards (directed slightly backwards), and then strongly curving backwards slightly beyond its middle; seen from above and in front the recurrent portion appears doubly sinuate, being concave externally in the basal half and internally in the distal half, the basal part stout, angular, and somewhat triquetrous, the distal part slender, terete, and subulate.

Total length $24\frac{1}{2}$, width of cephalothorax $4\frac{3}{4}$, length of pedipalp $25\frac{1}{2}$, of tibia $8\frac{1}{2}$, of metatarsus + tarsus $8\frac{1}{2}$.

Locality.—1 ♂ (reg. no. 4,661) from Etities, in Gt. Bushmanland, Kenhart Div., Cape Colony, captured by Mr. E. G. Alston.

According to Mr. Alston, this species is diurnal. In general appearance, particularly as regards the colour, the hairiness of the legs, and the size, it much resembles *spectralis* Purc. It is, however, nearest related to *sericea* Poc., and belongs to the small group of diurnal species which have no wide interval between the teeth of the single series, but have the hairs of the abdominal tergites darker than those on the sides of the abdomen (*sericea*, *fusca*, &c.).

SOLPUGA DERBIANA Poc.

Locality.—Grahamstown (♂, ♀, *Rev. J. A. O'Neil*).

SOLPUGA LATERALIS C. L. Koch.

Additional locality.—Dunbrody, on the Sundays River, Uitenhage Div. (♂, *Rev. J. A. O'Neil*).

SOLPUGA CHELICORNIS Licht.

Localities.—(a) Arabis (about 30 miles north of Concordia), Little Bushmanland, Namaqualand Div., Cape Colony (♂, *J. H. C. Krapohl*).

(b) Etities, near Pella, Gt. Bushmanland, Kenhart Div. (♂, *E. G. Alston*).

(c) Styrkraal, on the Orange River, Gt. Bushmanland, Kenhart Div. (♂, *Max Schlechter*).

I have also seen a male from Willowmore, collected by Dr. Brauns.

S. villosa Purc. (Ann. S. A. Mus., v. 1, p. 423, fig. 24, ♂), the locality of which is unknown, is not a distinct species, as it differs

from the ordinary *chelicornis* principally in having the flagellum shorter in length and higher at the anterior bend.

SOLPUGA HOSTILIS (White).

This species has been recorded by Pocock from Pretoria and Barberton (Transvaal) and from Estcourt (Natal), and by Simon from Basutoland.

Additional localities.—(a) Johannesburg, Transvaal (♂, ♀, *H. A. Fry, Alex. Ross*), where the species appears to be common.

(b) Rietvlei, Umvoti District, Natal (♂, ♀, *H. A. Fry*).

S. cultrata, Purc. (Ann. S. A. Mus., v. 1, p. 427, figs. 27–27b), is merely a dark-coloured variety of *hostilis* (White).

SOLPUGA LINEATA C. L. Koch.

Additional localities.—(a) Dunbrody on the Sundays River, Uitenhage Div. (♂ and juv., *Rev. J. A. O'Neil*): Pedipalps and first leg with black stripes.

(b) Between Montagu (Robertson Div.) and Barrydale (Swellendam Div.), (♂, *Isaac Meiring*): Pedipalps and first leg with black stripes.

This species is diurnal, the ♂, ♀ and juv. having been observed running about in the sunshine, often, especially in the case of the ♂, with great rapidity (*L. Péringuey, Rev. J. A. O'Neil, I. Meiring*). Some very interesting observations concerning its habits were made by the Rev. J. A. O'Neil, who discovered examples of the ad. ♂, ♀ and juv. on a number of occasions in the nests of *Termes unidentatus* Wasm., sometimes as much as three feet underground. A couple of females kept in captivity for a few days by Mr. O'Neil devoured in that period some hundreds of workers and soldiers of *T. unidentatus*.*

GEN. BLOSSIA Sim.

BLOSSIA NAMAQUENSIS, n. sp.

(Fig. 2.)

♂. *Colour* pale yellowish; the tibia, apex of femur and base of metatarsus of fourth leg tinged with reddish brown: pedipalps pale yellow; chelicerae, cephalothorax, dorsal surface of abdomen, the legs in part and the proximal portions of the pedipalps thickly covered with very short, erect, apically notched or truncated cylinder-

* Kraepelin mentions that *Solifuge* in general feed principally on termites (Das Tierr., Palp. and Solif., p. 9).

bristles, the distal portion of the pedipalp and of the legs and the under side of the abdomen thickly covered with longer, slender, apically notched, cylindrical bristles.

Chelicerae with a number of apically notched or blunted spines on the upper and outer surfaces, the long posterior ones of the upper surface arranged in an oblique row; distal part provided with long slender bristles on each side, the dorsal surface with a long horizontal distal bristle, which, rising close behind the insertion of the flagellum, becomes gradually thinner towards the apex and is covered with very minute spinules in its distal part. Upper finger strong, evenly curved, with two large, pointed, distal teeth placed as far from the apex as the distal tooth of the lower finger, and followed by a rudimentary intermediate tooth, a large fourth tooth, and several smaller teeth. Lower finger with two large pointed teeth and a very minute intermediate one between them.

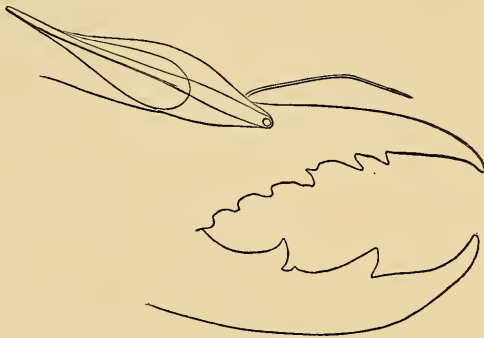


FIG. 2.—*B. namaquensis*, n. sp.

Flagellum lanceolate (seen from the side), the apex long and slender, the opening on the inner side large, the basal part hollow, gradually narrowing anteriorly, but not petiolate, rotatably attached at the anterior end to the inner side of the upper finger behind the level of the third large tooth of the single series; the flagellum is membranous and transparent, its surface is thickly studded with minute prickles right up to the apex, and the lateral wall is furnished along its middle with a thick, pale yellowish, longitudinal rib extending throughout the whole length.

Cephalothorax with a few, very short, brown spines scattered amongst the very numerous, short, cylindrical bristles; the hind margin, like that of the thoracic segments, with a row of longer notched spines.

Tergites of abdomen with some short scattered spines, which are replaced in the posteriormost segments by longer cylindrical bristles. Second abdominal segment provided below with two clusters, each consisting of a pair of long, slender, filiform, contiguous, reddish hair-structures, and curved backwards and towards the median plane, but not meeting the adjacent cluster.

Pedipalps with several stout spines below, hidden amongst the cylinder-bristles on the tibia and metatarsus; the cylindrical bristles on the dorsal surface of the tibia very short in the basal two-fifths, but much longer in the distal three-fifths of the segment.

Total length $11\frac{1}{4}$, length of pedipalp $12\frac{1}{2}$.

Locality.—1 ♂ from Steinkopf, Namaqualand Div. (*M. Schlechter*).

BLOSSIA UNQUICORNIS, n. sp.

(Fig. 3.)

♂. *Colour* pale yellow to reddish, the cephalothorax at the sides, the abdominal tergites and in one specimen, also, the metatarsus of the pedipalps and the fourth leg in places, more or less marked with dark brown or reddish brown, the anterior margin of the cephalothorax also more or less darkened; the very short cylindrical bristles on the limbs and body reddish, giving the whole animal a reddish tinge.

Cephalothorax and *abdominal tergites* as in *namaquensis*; the second abdominal segment provided below with two clusters of acute, sickle-shaped, rather thick and fleshy, reddish hair-structures, each cluster composed of two such hairs and meeting the adjoining cluster distally in the median plane.

Pedipalps with several short spines below among the long cylinder-bristles of the tibia and metatarsus, the dorsal surface of the tibia with very short cylindrical bristles throughout.

Chelicera thickly covered with strong spines; the distal dorsal bristle strongly curved, thick at the base but becoming rapidly thinner and filiform, the slender portion covered with minute fine spinules. Upper finger strong, directed upwards and straight at first, but curving downwards towards the apex; the 5 distal teeth large, especially the first and the fourth, followed on the outer side by a row of other large teeth belonging to the double series; the distal tooth nearer the apex of the fang in the upper than in the lower finger; lower finger with 2 large teeth, and a small but not very minute one between them.

Flagellum membranous, broadly spatulate; the distal part broad,

densely covered with shaggy hairs, very obtuse at the apex; the proximal part narrowed and hollow, rotatably attached at its anterior

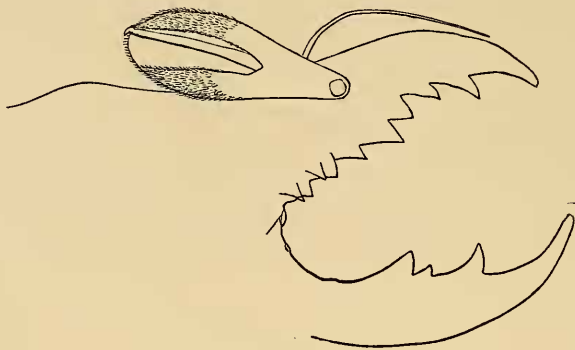


FIG. 3.—*B. unguicornis*, n. sp.

end to the inner surface of the upper finger behind the level of the large fourth tooth; outer wall of flagellum furnished with a strong yellowish axis, which terminates distally in a short and sharp claw.

Total length $9\frac{1}{2}$ – $12\frac{1}{2}$.

Locality.—2 ♂ from Dunbrody on the Sundays River, Uitenhage Div., Cape Colony (Rev. J. A. O'Neil).

A nocturnal species, closely allied to *namaquensis*.

BLOSSIA CREPIDULIFERA, n. sp.

(Fig. 4.)

♂. *Colour* pale yellow; the cephalothorax minutely, but in places only very faintly reticulated with dark brown over its surface; the tarsus, metatarsus, and the apex of tibia and of femur of the pedipalps (in ♂ from Touws River the apex of the pedipalps only) faintly tinged with brown or reddish brown.

Chelicera with numerous, rather slender spines; the distal dorsal bristle straight, its distal half minutely echinated on its surface but not slenderer than the proximal half, pointed at the apex. Dorsal finger conical in the basal half, then slightly bent downwards and continued into the slender, straight, distal half; the latter curved downwards at the tip, with the lower edge somewhat dilated and provided with 3 subequal, saw-edge-like teeth, the posterior edge of the second being longer than that of the first, and that of the second much longer still; conical basal half of finger with 2 distal teeth, of

which the posterior one is largest and terminates the single series, being followed posteriorly by a double row of about 3 outer and 3 inner teeth. Ventral finger only slightly curved, except at the apex, with 3 sharp teeth, the middle tooth small; the upper edge of the finger slightly convexly elevated for some distance in front of the distal tooth.

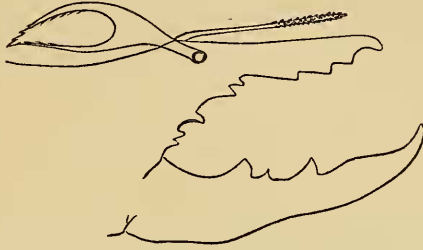


FIG. 4.—*B. crepidulifera*, n. sp.

Flagellum membranous, transparent and colourless, without longitudinal rib, the large opening directed inwards, the superior edge more convex than the lower edge, the distal end pointed; the free edges of the opening lacerated distally, only a little involuted above and below; anteriorly the flagellum is hollow and rotatably attached by a narrow stalk to the inner side of the upper finger just behind the level of the large posterior tooth of the single series.

Cephalothorax provided with a few medium-sized spines near the sides and in front scattered amongst the very short and numerous cylindrical bristles, the row at the hind margin composed of longer and slenderer spines than in *namaquensis*.

Abdomen.—The 2 clusters of hairs on under surface of second segment meeting distally in the median plane to form an arch, each cluster composed of 3 long, contiguous, filiform, curved hair-structures.

Pedipalps with the spines on the under surface of the tibia slender, those on the metatarsus not distinctly distinguishable from the long cylinder-bristles of the under surface.

Total length $8\frac{1}{4}$ – $10\frac{1}{2}$.

♀. A few ♀ or young from the Worcester District, probably belonging to this species, differ from the ♂ in having much shorter limbs, while the longer spines of the upper surface of the body are replaced by slenderer cylindrical bristles. The dentition is normal, the single series being composed of 2 large teeth, followed by a small one, and another large one. The spines on the ventral side of the pedipalps are shorter and distinct, even on the metatarsus, which is

tinged with reddish brown throughout. No fleshy hairs on second abdominal segment.

Localities.—(a) 1 ♂ (type) from Robertson, Cape Colony (*W. F. Purcell*).

(b) 1 ♂ from Touws River Station, Worcester Div. (*W. F. Purcell*).

(c) 1 ♀ from Worcester (*R. M. Lightfoot*).

(d) 2 ♀ or juv. from Brandvlei, Worcester Div. (*I. Meiring*).

Found hiding under stones in the daytime.

BLOSSIA KARROOICA, n. sp.

(Fig. 5.)

♂. *Colour* pale yellowish ; the cephalothorax towards the sides, the distal segments of the pedipalps and a considerable portion of the fourth leg more or less faintly tinged or marked with dark brown ; the chelicerae with 1 lateral and 2 dorsal darkish lines.

Cephalothorax with some long, notched, cylindrical bristles instead of spines near the sides and in front, and a row of still longer ones at the hind margin.

Abdominal tergites with some stout notched bristles or slender spines on anterior segments ; second abdominal segment below with 2 clusters of 3 fleshy hairs each, almost meeting distally in the median plane, the hairs long, filiform and curved.

Pedipalps with the cylindrical bristles on the dorsal surface of the tibia as long as those on the metatarsus ; the ventral surface of each of these segments with 3 long, strong, very distinct, equidistant spines in their middle part.

Chelicerae with numerous shorter and longer, mostly apically notched bristles instead of spines ; the distal dorsal bristle curved, its proximal half stout and minutely granular (except at the base), the distal half slenderer, subulate and smooth. Dorsal finger with the superior edge slightly convex and the lower edge almost straight, the tip of the finger curved sharply downwards and tooth-like ; the 3 distal teeth largest, the first laterally compressed, obtuse and very near the apex of the finger, followed closely by the second tooth, the second and third teeth pointed, with long posterior edges, the fourth and sixth teeth small with the larger fifth tooth between them, followed by several other teeth of the double series ; on the outer surface of the finger just at the base of the distal tooth is a sharp external tooth, distinctly visible from above. Ventral finger with 3 pointed teeth in its middle part, the intermediate tooth small ; in front of these is a large outer tooth with long, straight, posterior

edge, and an inner lamina with rounded edge rising from the inner edge of the upper surface of the finger.



FIG. 5.—*B. karrooica*, n. sp.

Flagellum slender, transparent, with slight sigmoid flexure (seen from the side), the basal half narrow and only slightly inflated, the anterior end obtuse and rotatably attached to the inner surface of the dorsal finger on a level with the small fourth tooth; the flagellum narrowing gradually posteriorly, the distal half slender, suddenly acuminate at the apex (seen from the side).

Total length 9.

♀. Limbs much shorter, but with less dark brown than in the ♂; the bristles on the chelicerae (except the distal dorsal one) and on the cephalothorax and the spines on the tibia and metatarsus of the pedipalps similar to those of the ♂, but somewhat shorter, the spines strong; upper finger of chelicerae normal, with 4 teeth in the single series, of which the third is small and the first, second, and fourth large, followed by a double series of 3 outer and 3 inner teeth. Lower finger with 2 large teeth and a small one between them.

Locality.—1 ♂ and 1 ♀, found under stones on karroo-kopjes at Prince Albert, Cape Colony (*W. F. Purcell*).

This species appears to be closely allied to *B. setifera* Poc.

GEN. HEMIBLOSSIA Krphn.

HEMIBLOSSIA O'NEILL, n. sp.

(Figs. 6, 7.)

♀. *Cephalothorax* blackish-brown, mostly paler and more yellowish in the central area, the surface thickly studded with numerous, very short, pale yellowish to blackish brown, pointed and truncated bristles, amongst which are scattered a number of longer blackish brown ones.

Thorax above and the *abdominal tergites* pale yellowish or

whitish, with numerous, colourless, apically notched, cylindrical bristles and a small number of longer blackish brown ones; the soft skin on the sides blackish brown, sharply marked off from the pale yellowish or whitish under surface, which is thickly covered with pale notched bristles.

Pedipalps blackish brown, the tip of the tarsus sometimes yellowish, the trochanter pale and more or less tinged with dark brown, the metatarsus thickly clothed on all sides with erect, truncated, almost black cylinder-bristles, with some longer dark brown bristles scattered amongst them, but without pointed spines; the rest of the limb, including the coxa, with mostly dark brown bristles, the outer and dorsal surface of the tibia with a coat of short truncated or notched cylindrical bristles.

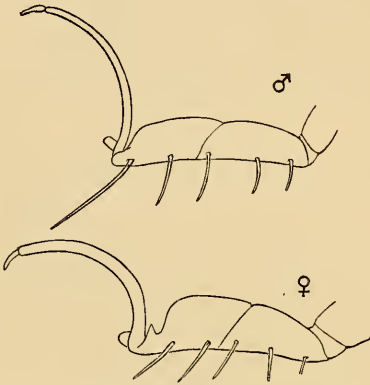


FIG. 6.—*Hemiblossia o'neili*, n. sp.; tarsus of fourth leg of ad. ♂ and ♀, seen from the side (the segmentation is much too distinctly marked in the figure).



FIG. 7.—*Hemiblossia o'neili*, n. sp. chelicera of ♂ from medial side.

Legs entirely pale yellowish or more or less tinged with blackish brown, with numerous colourless shorter bristles and a smaller number of longer dark brown ones; tarsus of fourth leg short, the thick part a little more than three times as long as high, often indistinctly divided by a transverse dorsal groove and by fine oblique lateral lines into 2 equal but not movably articulated segments, the dorsal groove sometimes obsolete and the tarsus then apparently unsegmented; femur of fourth leg thick, about $2\frac{1}{3}$ times as long as high. Malleoli broadly black-edged.

Chelicerae blackish-brown, with a lateral and 2 dorsal darker stripes; the upper finger strong, curving downwards distally, the

2 distal teeth strong, the third smaller but not minute, the fourth larger than the third and followed by 3 smaller outer teeth and 3 inner teeth of the double series; lower finger with 2 large teeth and a small one between them.

♂. *Pedipalps*.—The truncated cylinder-bristles on the metatarsus extremely dense and numerous, blackish brown, the shorter bristles on the rest of the limb (tibia to coxa) mostly whitish.

Legs.—Tarsus of fourth leg longer, 4–5 times as long as high and mostly more distinctly bisegmented. Femur of fourth leg about three times as long as high.

Chelicerae with the dentition very similar to that of the ♀, except that the lower finger is provided with a low elevation on the inner side near the apex.

Flagellum strongly laterally compressed, almost semicircular in outline, the upper part laminate, with sharp and convex upper edge, the lower part slightly inflated and hollow in the middle, with a narrow opening on the inner side below; anteriorly the flagellum becomes narrower and is rotatably attached at the obtuse anterior end to the inner side of the upper finger slightly behind the level of the large second tooth; the apex produced into 2 large horns forming a crescent, the superior horn hairy.

Total length of ad. ♂ $6\frac{1}{4}$ – $9\frac{3}{4}$, of largest ♀ $13\frac{1}{2}$.

Locality.—Several ♂ and ♀ specimens found running about in the sunshine by the Rev. J. A. O'Neil at Dunbrody, on the Sundays River, Uitenhage Div., Cape Colony (Nov., Dec.).

In the ♀ specimen of *H. bouvieri*, Krpln. (Upper Zambesi), upon which the genus was founded, the fourth tarsus, according to Kraepelin, is unsegmented and at most three times as long as high, but the ♂ is not known. The characteristic colouration of *bouvieri*, however, very closely resembles that of *o'neili*, which is of the diurnal type, while the *Blossia* are nocturnal.

GEN. GLUVIOPSIS Krpln.

GLUVIOPSIS AUSTRALIS, n. sp.

(Fig. 8.)

♂. *Colour*.—Chelicerae pale yellow, with some dark brown lines and reticulation; cephalothorax dark brown, the central area reticulated, the median line pale yellow, the eyes black; abdominal segments pale yellow, bordered with dark brown along the hind margins above, the posterior segments finely reticulated with brown

over the surface; pedipalps purplish brown, but the basal segments, the proximal half of the femur and the proximal two-thirds of the metatarsus, pallid; legs pallid, but the fourth pair with the femur in its distal part and the tibia and metatarsus towards the middle more or less darkened with purplish brown: under surface quite pale.

Chelicerae spined on upper and lateral surfaces. Upper finger straight, horizontal, curving downwards at the apex; its lower edge almost straight, with 4 large teeth in the single row, the third being only slightly smaller than the rest, the double series composed of 3 minute teeth in the outer row and one small posterior and 2 large anterior teeth in the inner row, the latter separated from the single series by a small interspace. Lower finger slightly curved, more curved at the apex, with 3 teeth, of which the anterior is the largest and the middle one minute.

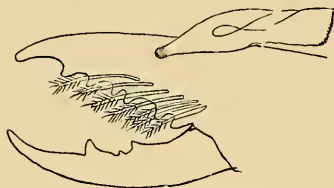


FIG. 8.—*G. australis*, n. sp.

Flagellum inflated in the middle, with a small oval opening on the inner surface, attenuated anteriorly and rotatably attached at its anterior end to the medial side of the dorsal finger above the space between the fourth and fifth teeth, the distal part strongly compressed and bent outwards, colourless, membranous, very broadly subtruncated and lacerated at the apex.

Pedipalps long and strong, with some truncated cylinder-bristles below; the femur spindle-shaped, with a row of 3 spines below, of which the 2 proximal ones are small and the distal one larger; the tibia nearly straight above but dilated below, the lower surface with 2 rows of very stout spines, viz., 2 inner and 3* outer ones, in the distal half, the outer row supplemented proximally by a weak fourth spine; the metatarsus attenuated at the base, with 2 rows of short spines below, the inner row of 4 with the proximal spine in the middle of the segment, the outer row of 5 with the proximal spine situated proximally to the middle, the distal spine of both rows placed at the apex of the metatarsus.

* The proximal one is broken off, but marked by a scar in the only pedipalp present.

Cephalothorax strongly produced in front, the apex slightly truncated in front of the large eyes and bearing 2 spines; the upper surface covered with a number of short obtuse spinules, with some longer spines at the sides and along the hind margin.

Abdomen with some short spines on the dorsal surface and a row along the hind margin of the tergites; ventral surface with numerous apically notched, cylindrical bristles, the second and third segments each with 2 clusters of obovate, apiculate, fleshy hair-structures, 2 in each cluster, near the hind margin, the fourth and fifth segments with a long transverse row of longer and much narrower oblancoolate, pointed bristles.

Total length $7\frac{3}{4}$, length of pedipalps $8\frac{3}{4}$, of fourth leg 10.

Locality.—1 ♂ from Styrkraal, near the Orange River, in the northern part of Kenhart Div., Cape Colony (*Max Schlechter*). No species of this genus has been previously recorded from South Africa.

GEN. HEXISOPUS Karsch.

HEXISOPUS LANATUS (C. L. Koch).

Additional Locality.—3 ♂ from Bladgrond, Great Bushmanland, in N.W. of Kenhart Div., Cape Colony (*Max Schlechter*). In these specimens the rim of the cup which forms the base of the flagellum is straight or nearly so, the procurrent portion of the shaft is not distinctly keeled below, and the ocular tubercle is shorter and less conical in front.

In the ♂ from Grasmond, described in a previous paper (*Ann. S. A. Mus.*, v. 1, pp. 385–386, fig. 6), the upper rim of the cup is slightly bent downwards, so as to partially cover the opening, as shown in the figure, while the procurrent portion of the shaft is distinctly keeled below.

The recurrent portion of the flagellum appears to be evenly rounded above in all the specimens (not feebly sulcate above, as previously stated on p. 386). The dorsal finger of the chelicerae of the ♂, also, is provided on its inner surface from above the base of the flagellum to the base of the red terminal fang with a number of very short, mostly blunted, pale or reddish spines, the distal ones longer and very dense, forming a tooth-like tuft which is situated on a level with the distal edge of the granulated oval area.

The length of the segments of the claws is very variable, the basal segment being sometimes much longer (♂ from Bladgrond), some-

times subequal to or even much shorter than the apical segment (specimens from Little Bushmanland).

HEXISOPUS RETICULATUS, n. sp.

(Fig. 9.)

♂. *Colour*.—Chelicerae yellow, with fine infusate reticulation on the sides and above, the terminal fang reddish at the base, black at the apex (one of the chelicerae with a lateral and two dorsal, longitudinal, infusate stripes uniting distally, these stripes partly obsolete on the other chelicera). Cephalothorax blackish brown, with a narrow, sharply marked, yellow border at the lateral and anterior margins, and a large, three-leaved, yellowish, reticulated mark in the centre; the surface covered with long, soft, white hairs and sparsely distributed, short, dark brown bristles. Thoraco-abdomen infusate above at least in the anterior segments, covered with long, soft, white hairs, the anterior edge with some short, dark brown ones in addition. Legs and pedipalps pale yellow.

Chelicerae.—Upper finger evenly curving downwards towards the apex, the terminal fang rather pointed, scarcely curved outwards, flattened externally, dilated internally at the base in the same manner as in *lanatus*; teeth of the upper finger as in the description of *lanatus* (Ann. S. A. Mus., v. 1, p. 385). Lower finger long, slender, strongly curved, with a small tooth behind the middle. Inner side of upper finger provided with a distal tooth-like tuft of reddish spines, similar to those in *lanatus* (p. 221 above).

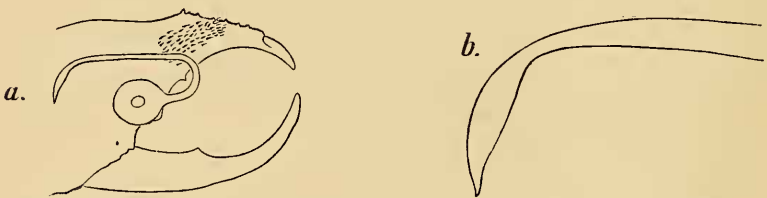


FIG. 9.—*H. reticulatus*, n. sp.; a, left chelicera from medial side; b, apex of flagellum more magnified.

Flagellum.—Basal cup large, equalling the procurrent portion in length; the shaft cylindrical, curved semicircularly at the anterior bend, then straight for some distance and strongly curved downwards again at the apex, the apical portion strongly compressed, blade-like, slightly dilated and sharp-edged below and ending in a point at some distance behind the basal cup.

Pedipalps.—Metatarsus with numerous long hairs and short truncated cylindrical ones along its whole length.

Locality.—One ♂ found by Mr. M. Schlechter near the Orange River, between Bysteeek and the Great Falls at Aughrabies, Kenhart Div., Cape Colony. Total length $11\frac{1}{4}$ mm.

Resembling *H. nigrolunatus* Krpln. in the dark colouration, but the structure of the lower finger of the chelicerae is quite different.

GEN. CHELYPUS, nov.

The ♂ differs from that of *Hexisopus* * principally as follows :—

Fourth leg with the 3 distal segments extremely broad (the 2 distal ones broader than long), bluntly angular along the outer edges; the metatarsus broader than the tibia, subequalling the latter in length along the outer inferior edge and longer than the tarsus, its distal part strongly compressed from below; the tarsus very strongly flattened from below and above, almost discoid in shape, with a very narrow outer side bearing a row of 5-6 short, broad, blunt spines; inferior surface of the 5 distal segments, as well as the external surface of the tibia and metatarsus, hairless but densely covered with extremely abbreviated, dentiform or granuliform spinules, the hind margin of the 2 femoral segments with longer spines. *Third leg* with the tibia and the distal segment of femur triquetrous, their posterior surface flattened, hairless and densely covered with strongly abbreviated spinules similar to those on the fourth leg, those along the upper and lower edges longer, particularly on the tibia, the tibia strongly dilated below, its thickness (measured dorso-ventrally) much greater than that of the distal femoral segment. *Claws* of second and third legs composed almost entirely of the distal segment, the proximal segment extremely short and indistinctly marked off. Distal segments of *pedipalps* strongly spined. *Chelicerae* without stridulating ribs on the inner surface, which is furnished instead with a large smooth area marked with some fine and quite

* Kraepelin's nomenclature for the segments of the legs (Das Tierr., Palp. & Sol., p. 7, fig. 8) is preferable to that previously used by me (Ann. S. A. Mus., vol. i. p. 382, fig. 1), and will be adopted here. All the legs in *Hexisopus*, therefore, are considered as having only one tarsal joint (not counting the minute apical piece bearing the claws), which is preceded by the metatarsus, the tibia, and the distal and proximal femoral segments. The 4 distal segments are directed forwards in the second and third legs, but backwards in the fourth leg, and the spinous outer surface of these segments correspond, therefore, to the posterior surface in the former legs but to the anterior surface in the latter leg.

irregular furrows. Ocular tubercle and anterior half of *cephalothorax* densely covered with reddish granules (abbreviated spinules). Upper lobe of *rostrum* as long as the lower lobes.

In *Hexisopus* the 3 distal segments of the fourth leg are terete or only slightly compressed and without angular edges, the tibia is much longer than wide and subequal in length to the 2 distal segments together, the metatarsus is narrower than the tibia and the tarsus narrower than the metatarsus, each of them being also longer than wide. The tibia of the third leg is terete and much slenderer than the femur. The pedipalps are not spined, the inner surface of the chelicerae is provided with a number of parallel stridulating ribs, and the upper lobe of the rostrum is much shorter than the lower lobe.

CHELYPUS BARBERI, n. sp.

(Fig. 10.)

♂. *Colour* reddish yellow to pale yellow, the chelicerae with a pair of darker marks at the base above, terminal fang and lower finger reddish black at the apex, the cephalothorax with a large, faintly infuscated, oval ring on each side of the tubercle, the latter blackened round the eyes; all the spines and spinules, including the granuliform ones, reddish, the soft silky hairs pale yellowish.

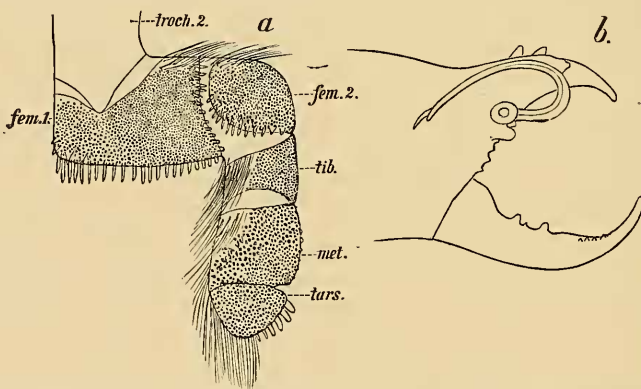


FIG. 10.—*C. barberi*, n. sp.; *a*, left fourth leg from below; *b*, left chelicera from medial side.

Pedipalps.—Tarsus with a superior, distal, transverse row of 4 stout spines; the metatarsus with several short oblique rows of 2, 3, and 4 stout spines above, below, and on the sides, the inferior

surface with stout setæ in addition ; the tibia with some stout distal spines on the sides and below ; the upper surface of the tibia and of the proximal part of the metatarsus densely covered with abbreviated granuliform spinules.

Chelicerae hairy, the upper surface densely covered with minute pointed spinules. Upper finger furnished internally with several, short, stout spines, the dorsal surface with a small, distal, oval area containing 2 very large, black tubercles ; the terminal fang curving downwards, laterally compressed, furnished with a large basal tubercle on the inner side above ; inferior surface of finger with a large inner tooth behind the middle and an outer row of 5 small teeth, the distal tooth very remote from the apex. Lower finger strongly upcurved distally, with a moderate-sized tooth in the middle, another similar one behind the middle, and a very minute tooth between these two, the upper edge provided further with a low outer keel and a row of minute inner teeth in front of the other teeth.

Flagellum, as in *Hexisopus*, rotatably attached by a cup-like basal enlargement just above the large inner tooth of the dorsal finger, the shaft at first procurent, then curving upwards, then backwards, and finally downwards, terminating a little behind the basal cup, the apex bifid, the medial branch short and tooth-like, the lateral branch longer and subulate.

Total length 30 mm.

Locality.—One ♂ found by Mr. Barber under a bush in British Bechuanaland about 100 miles south of the junction of the Moshowing with the Molopo Rivers.